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13th
Iranian
International
Congress of
Toxicology
Urmia
May 2015

A WORLD FREE FROM
POLLUTANTS



In the Name of God

13th Iranian International Congress of Toxicology

Urmia University-Urmia-Iran

“A World Free From Pollutants”

12th-14th May, 2015

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Welcome Messages

In the Name of God

Ladies and Gentlemen,

It is a great pleasure to welcome you all here. Urmia University is pleased to host the 13th Iranian International Congress of Toxicology. The theme of the event has been rightly chosen as “The World Free From Pollutants” to reflect upon the implications of pollution on our environment. Years of unsustainable development in our planet has yielded the bleak situation where we are surrounded by air pollution, rapid increase in cancer rate, barren soils, dramatic decline in biodiversity and the list goes on. For years we have violated Mother Nature Right at the expense of short-sighted progress. The impact of our neglectful stewardship has left us with a little hope of bright future for the next generations. Urmia Lake’s current grim reality is a vivid example our unjust attitude towards the environment.

Sustainability and responsibility through practicing global citizenship is the only way forward to protect our precious planet, there is no plan B, because there is no planet B! Suitability should be built on everything we do, every building we construct, every drug we design, every research we plan and in a nutshell, it should be a way of life.

I would like to thank you for coming together to advance all of these efforts. I call upon the scientific and research community, international experts, authorities and donors to continue your essential work to develop practical smart, integrated solutions for a clean, safe and sustainable environment.

I wish you a successful conference.

Rahim Hobbenaghi

Congress President

11 MAY 2015, Urmia, Iran

Respected Delegates and Dear Colleagues:

Science and innovation has been as old as the Iranian Civilization itself, in Iran from the **Algorithm** and **Avicenna** time to the times of **Balali-Mood** and **Abdullahi**, Iran has come a long way. The outlook of science is constantly being reinvented as we look for smaller, faster, newer, cheaper ways of completing scientific tasks. This requires that the mind be allowed to think without boundaries or limitations. We have to first think of the impossible and then make it happen.

The **13th Iranian International Congress of Toxicology** is a mega event, which is aimed to be a path blazer for our young and also future generations. The theme has been selected as “A World Free from Pollutants”. This theme reflects our intense desire to utilize science and technology to meet the growing aspirations of our people as a Nation. We are standing at the threshold of becoming one of the major developing countries of the World, and it is the events such as this Congress, that make us realize the crucial role of science, innovations for growth and development. We firmly believe that there is no border and limitation for science and technology. Indeed, toxicology is a multi disciplinary field of biomedicine. As evidenced by various aspects of toxicology from one hand side and considerable energetic attendees on the other side, toxicology could be a platform for many young and established researchers to present their findings in basic and clinical toxicology.

The issues and challenges ahead shall be discussed and deliberated upon by the leading scientific professionals from Iran and abroad. I am sure that the scientific deliberations held here, based on the very relevant theme of ‘Toxicology’ shall help us to draw a clear road map for further research and strategies.

The City of Urmia is famous for its cultural and historical heritage and its people hospitality. I learned that the 1st Medical College has been established in this city and actually in this campus which the current congress is held. We in this beautiful city are living side by side with various religious and occupations. At the same time

Urmia is the only city of Iran, which does have three border lines with our respected neighbors with peaceful relationships.

I am deeply indebted to his Excellency Ghorban Ali Saadat, the Governor of West Azerbaijan, Dr. Rahim Hobbenaghi, the chancellor of Urmia University, Dr. Javad Aghazadeh, the chancellor of Urmia University of Medical Sciences and Professor Omid Sabzevari, the president of Iranian Society of Toxicology, for their constant and kind support to host this huge scientific congress.

With the promise of providing all the best from scientific and non-scientific items, On behalf of the executive & scientific committees, it is my honor to welcome you to the 13th Iranian International Congress of Toxicology and wish you a pleasant stay in Urmia.

Hassan Malekinejad

Scientific Secretary

11 MAY 2015, Urmia, Iran

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Analytical Toxicology

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Dr. J. Nowruz Zadeh

Key Lecturer

Prof. A. Tsatsakis

Abstract No: Key Lecture

The Challenges of Modern Analytical Chemistry in Exposure Science and Bio monitoring in Toxicological Issues and Risk Assessment

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Abstract

The input of new data from modern analytical tools has considerable impact in exposure science, toxicological endpoints, risk assessment and public health. Monitoring of human exposure to various chemicals and environmental hazards nowadays determined as biomonitoring plays crucial role in the formation of governmental public health policy related laws and regulations aimed to achieve public health care goals. It is obvious that validity and credibility of biomonitoring data used is vital for the development and approval of proper measures which can have impact on different aspects of social life and progress. The recent developments in analytical instrumentation and especially in chromatography-mass spectrometry ensure the requested validity and extend substantially the potential of bio monitoring by enhancing speed and efficiency of chemical analysis. Also recent achievements contribute in the development of new biomonitoring strategies and particularly simultaneous screening for the exposure to target, untargeted and unknown hazards. Nevertheless one major problem for the inadequacy of validated linking of chemical exposure to health problems refers to the biomarkers used for the studies. Growing interest in the discovery and investigation of biomarkers of effect as a convergence point of analytical chemistry, biochemistry and molecular biology can be noted. Principles and applications of bio monitoring for chemical low level long-term exposure will be discussed in the frame of analytical, genetic and bioethical issues. Furthermore, the role of in-vivo experiments in methods optimization and validation will be presented. Findings from our recent studies on POPs, pesticides, heavy metals, and drugs will be reported. Cross-sectional studies on pregnant women and the neonates with documented prenatal pesticide low level chronic exposure revealed the impact of pesticides on fetus development and pregnancy outcomes and also for hypospadias in children. Hair analysis as biomonitoring tool provides information on chronic and acute exposure with many applications in several areas of medical, forensic and environmental science and has already been applied in forensic investigations, autopsy, serial criminal cases, rape cases, doping control. In clinical practice sectional hair testing can check the compliance to therapy regime for people under long-term treatment. The knowledge of the chemical deposition variability in different anatomical hair sites is of significant importance to evaluate the data. A great number of health problems are already associated with low level occupational exposure while certain differences identify strategies for exposure assessment and related health issues in Europe and in Developing Countries. Innovative biomarkers of exposure, of effect and of susceptibility on molecular, cell and tissue level needed for linking to symptoms, clinical findings and diseases. Generally the problem is complicated due to the complexity of the overall human exposure and the multiple effects exerted by one chemical in terms of the mechanisms of toxicity. An important factor is

the difficulty in reliable identification of exposed and control groups. Furthermore, the characteristics of exposure, in particular concerning duration and involvement of variable environmental factors and mixtures make any epidemiological approach very difficult. Real life is a variability and diversity of exposures the overall effect of which is pending on the certain case. Exposure issue effects in reality are not monomodal/monotonic events even in very low, low and/or high exposures. The biomonitoring data can be used for development of in silico models for the prediction of possible exposure and thus prevention of health risk.

Keywords: Risk Assessment, of Modern Analytical Chemistry

Application of dispersive liquid-liquid microextraction and HPLC for determination of amphetamine, methamphetamine and pseudoephedrine in urine

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2-Legal Medicine of Mazandaran, Sari, Iran

Abstract

Background: Amphetamine and methamphetamine are powerful central nervous system (CNS) stimulants that have been in use since the early 1900s. They are drugs of abuse as well as doping agents in sports [1]. The confirmation of positive amphetamine and methamphetamine screening tests is usually performed using gas chromatography– mass spectrometry (GC–MS) [2]. But there is a major drawback in confirmation of positive amphetamine results with GC-MS. Usually ephedrine, pseudoephedrine, and other sympathomimetic amines present in various over-the-counter cold medications can partially be converted to methamphetamine when heated to 300°C in the injection port of the GC which cause false positive results [3]. This limitation of GC-MS necessitates the development of HPLC method for determination of amphetamines to overcome the problem of false positive results in the presence of pseudoephedrine.

Materials & Methods: In this study a fast, simple and reliable dispersive liquid micro extraction (DLLME) in combination with HPLC was used for extraction of amphetamine, methamphetamine and pseudoephedrine in urine sample. The extraction conditions were optimized and 2.5 mL of acetone as disperser solvent, 250 µL of chloroform as extraction solvent and 0.01% volume of hydrochloric acid were the appropriate conditions for extraction. Determination was performed using HPLC with diode array detector set at 210 nm. The appropriate mobile phase for separation and determination of compounds was water: acetonitrile (85:15) with pH=2.38 (adjusted by phosphate buffer). At the appropriate condition for separation relative standard deviation of compounds were in the range of 3.4-5.12%. Linear ranges of compounds were in the range of 0.69-1060.0 ng/mL and detection limits were in the range of 0.69-1.17 ng/mL. Determination of amphetamine and methamphetamine in urine sample was performed and their concentrations were 380 and 700 ng/mL, respectively.

Keywords: Amphetamine; Methamphetamine; pseudoephedrine; Dispersive liquid-liquid microextraction; HPLC; false positive results.

Determination of donepezil in serum samples using molecular imprinted polymer nanoparticles followed by HPLC-UV detection

Shahrzad Bigloo, Farzad Kobarfard, Mehrdad Faizi, Mehdi Rajabnia Khansari, Jaber Javidi

Research Center, Faculty of Pharmacy, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Abstract

Background: A molecularly imprinted polymer (MIP) designed to enable the selective extraction of donepezil from serum samples has been synthesized using a non-covalent molecular imprinting approach.

Materials & Methods: The MIP was evaluated chromatographically in the first instance and its affinity for donepezil also confirmed by solid-phase extraction (SPE). The optimal conditions for SPE consisted of conditioning of the cartridge using acidified water purified from a Milli-Q system, loading of the sample under basic aqueous conditions, clean-up using acetonitrile and elution with methanol/TFA. The attractive molecular recognition properties of the MIP gave rise to good donepezil recoveries (between 90 and 102%).

Result & Conclusion: The data indicated that the imprinted polymer had a good selectivity and affinity for donepezil and could be used for selective extraction and analysis of donepezil in human serum.

Keywords: Molecularly imprinted polymer; Donepezil, Solid-phase extraction; blood samples; Affinity, Selectivity

Investigation deaths due to drug abuse in Zanzan Legal Medicine from 2010 to 2014

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Abstract

Background: Drug abuse as defined by the World Health Organization to any application for non-medical purposes and further refers to a change in mood. Drug abuse can occur in gratifies, suicide, homicide or accidental. Identification of common drugs in abuse in the community and pattern of drug abuse is a necessity for planning and control of drug abuse in community.

Materials & Methods: In this study noted 150 deceased bodies that toxicated with opioids and drugs that referred to Zanzan Legal Medicine Organization from 2010 to 2014. Data of sex, age and cause of death collected from deceased files. Deceased samples had been analyzed by TLC, HPLC & GC-MS. Collected data analyzed with SPSS 16.

Results: in 150 deceased, bodies were 138 men and 12 women. 68% with opioid, 20% prescription drugs, 6% psychoactive drugs, 6% synthetic opioids toxicated. 70% of men toxicated with opioids, 17% toxicated with prescription drugs. And 13% toxicated with psychoactive drugs and synthetic opioids. 50% of women toxicated with prescription drugs and 50% of women toxicated with opioid and psychoactive drugs. 80% of deceased cases abused combined drugs. Methadone, Morphine, Tramadol, Codeine, MDA, and Amitriptyline had more frequency. More frequency was in 31-36 years old range. Use of The Methadone-Morphine, Methadone-MDA, Morphine-Codeine, and Morphine-tramadol were associated with together.

Conclusion: Because of the high frequency in the men especially in opioid toxication have to program in control of this type of society. And the women have to control prescription drugs toxication and distribute and prescribe of drugs that can control especially in Methadone, Tramadol, Amitriptyline, Ibuprofen & diazepam.

Keywords: Drug abuse, toxication, Cause of death

Validation of an Analytical Method for Determination of benzo[a]pyrene in bread using QuEChERS method by GC-MS

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2-Department of Pharmacology and Toxicology, School of Pharmacy, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

Abstract

Background: A fast and simple modified QuEChERS (quick, easy, cheap, rugged and safe) extraction method based on spiked calibration curves and direct sample introduction was developed for determination of benzo[a]pyrene (BaP) in bread by gas chromatography-mass spectrometry single quadrupole selected ion monitoring (GC/MS-SQ-SIM).

Materials & Methods: Sample preparation includes extraction of BaP into acetone followed by cleanup with dispersive solid phase extraction. The use of spiked samples for constructing the calibration curve substantially reduced adverse matrix-related effects. The average recovery of BaP at 6 concentration levels was in range of 95–120%. The method was proved to be reproducible with relative standard deviation less than 14.5% for all of the concentration levels. The limit of detection and limit of quantification were 0.3 ng/g and 0.5 ng/g, respectively. Correlation coefficient of 0.997 was obtained for spiked calibration standard over the concentration range of 0.5-20 ng/g. To the best of our knowledge, this is the first time that a QuEChERS method is used for analysis of BaP in breads. The developed method was applied for determination of BaP in 29 traditional (Sangak) and industrial (Senan) bread samples collected from Tehran in 2014.

Results: These results showed that two Sangak samples were contaminated with BaP. Therefore, a comprehensive survey for monitoring of BaP in Sangak bread samples seems to be needed.

Conclusion: This is the first report concerning contamination of bread samples with BaP in Iran.

Keywords: Polycyclic aromatic hydrocarbons, benzo[a]pyrene, Bread samples, QuEChERS, Gas chromatography – Mass Spectrometry, Iran

Basic Toxicology

Panel Chair

Prof. O. Sabzevari

Panel Members

Prof. E. Tamadonfard

Prof. A. Tsatsakis

Key Lecturer

Prof. J. Pourahmad

Abstract No: Key Lecture

A Link between Basic Toxicology and Novel Anti-Cancer Drug Discovery

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Abstract

Background: Mitochondria are semi-autonomous organelles that play essential roles in cellular metabolism and programmed cell death pathways. Genomic, functional and structural mitochondrial alterations have been associated with cancer. Some of those alterations may provide a selective advantage to cells, allowing them to survive and grow under stresses created by oncogenesis. Due to the specific alterations that occur in cancer cell mitochondria, these organelles may provide promising targets for cancer therapy. The development of drugs that specifically target metabolic and mitochondrial alterations in tumor cells has become a matter of interest in recent years, with several molecules undergoing clinical trials. This lecture focuses on the most relevant mitochondrial alterations found in tumor cells, their contribution to cancer progression and survival, and potential usefulness for stratification and therapy.

The past decade has revealed a new role for the mitochondria in cell metabolism – regulation of cell death pathways. Considering that most tumor cells are resistant to apoptosis, one might question whether such resistance is related to the particular properties of mitochondria in cancer cells that are distinct from those of mitochondria in non-malignant cells.

Conclusion: This review is devoted to the analysis of mitochondrial function in cancer cells, including the mechanisms underlying the up regulation of glycolysis, and how intervention with cellular bioenergetics pathways might make tumor cells more susceptible to anticancer treatment and induction of apoptosis.

Keywords: Cancer; Chemotherapeutics; Metabolic remodeling; Mitochondria; Oxidative stress

TGF- β 1+915G/C (Arg/Pro) codon 25 polymorphism determine the stage of COPD disease: If the anti-inflammatory effect of TGF- β 1+915G/C (Arg/Pro) codon 25 is predominant in COPD (chronic obstructive pulmonary disease)?

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Abstract

Background: COPD (chronic obstructive pulmonary disease) is a slowly progressive condition characterized by airflow limitation, which is largely irreversible inflammatory responses are the major hallmark of COPD. The transforming growth factor (TGF)- β is an anti-inflammatory and fibrotic cytokines. Emerging interest in the role of TGF- β in the pathogenesis of COPD has recently evolved, particularly since genetic studies have demonstrated an association of gene polymorphisms of the TGF- β superfamily with COPD. The production of TGF- β 1 is predominantly under genetic control and significantly associated with gene polymorphisms. Among the different sequence variations identified in the TGF- β 1 gene so far, the sequence variation at codon 25 has been found to be associated with the severity of different diseases including COPD. The aim of this study was to find an association between TGF- β 1+915G/C (Arg/Pro) codon 25 polymorphism with the stages of disease and number of exacerbation in the cigarette smoking patient with COPD.

Materials & Methods: Two-hundred COPD patients were included into the study. COPD stage and number of exacerbation during last year was determined according to their FEV1 and history respectively. Polymorphism of TGF- β 1 +915G/C (Arg/Pro) codon 25 was determined using PCR-ARMS (Polymerase Chain Reaction-Amplification Refractory Mutation System). Chi-square test was used to analyze the association of TGF- β 1 +915G/C (Arg/Pro) codon25 polymorphism with number of exacerbations and stage of disease.

Results: There was a significant relation between TGF- β 1+915G/C (Arg/Pro) codon 25 polymorphism and stage of COPD as the frequency of C allele was higher in the patients with higher stage of disease. There was a trend ($p=0.06$) between TGF- β 1+915G/C(Arg/Pro) codon 25 and number of exacerbations, as the frequency of CC allele was higher in the patients who had more numbers of exacerbation.

Conclusion: Our result show that polymorphism of TGF- β 1+915G/C (Arg/Pro) codon 25 might be a risk factor for higher stage of COPD. This effect can be explained by this fact that presence

of C allele decrease production of the anti-inflammatory TGF- β 1+915G/C(Arg/Pro) codon 25 cytokine. More studies with larger number of cases is recommended to confirm these findings.

Keywords: TGF- β 1+915G/C(Arg/Pro) codon 25 anti-inflammatory polymorphism, COPD, Stage, Exacerbation, Smoker

The Increment of Genoprotective Effect of Melatonin due to “Autoptic” Effect versus the Genotoxicity of Mitoxantrone

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Abstract

Background: Recently, it has been shown that all living cells produce ultra-weak photon emission (UPE) spontaneously and continuously.

Materials & Methods: The intensity of UPE is in the order of a few, up to 10^4 photon/ (cm²sec) (or 10^{-19} to 10^{-14} W/cm²) measurable by photodetectors. UPEs are produced from diverse natural oxidative and biochemical reactions, especially free radical reactions and the simple cessation of excited molecules. Also, it has been evidenced that UPE has a signaling role at a distance among different cell cultures. Genotoxicity due to the effect of anti-cancer drugs on the healthy cells in cancerous patients is one of the problems of chemotherapy. Mitoxantrone is a chemotherapy anti-cancer drug, which can have side effects on the healthy cells like secondary cancers. On the other side, Melatonin is a hormone that is responsible for the daily rhythm adjustment and has several properties to be anti-cancer and anti-inflammation, and therefore it has a genoprotective effect against the genotoxicity. In our work, we investigated the effect of UPE among similar cells (i.e. called “Autoptic effect”) by using mirrors around the cell plate(s). Here, we have used HepG2 as sample cancer cells.

Results: Our results based on the Comet assay method indicated that the genoprotective effect of melatonin in presence of mirrors had significant difference with one without mirrors ($p < 0.05$) against the genotoxicity of mitoxantrone.

Conclusion: As a conclusion, the autoptic effect can increase the genoprotective effect of melatonin.

Keywords: Genoprotective effect; Melatonin; Genotoxicity; Mitoxantrone; Biophoton; Autoptic effect

Thermal stress-induced heat shock protein expression can be alleviated by galacto-oligosaccharides

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Abstract

Background: Thermal stress can negatively affect human and animal health and can lead to dehydration, heat exhaustion and heat syncope. Heat shock proteins (HSPs), are a group of proteins induced by stress. They play a crucial role in folding/unfolding of proteins and protection of cells against stress-induced apoptosis. On the other hand, overexpression of HSPs can result in growth inhibition of cells. We hypothesized that prebiotic, galacto-oligosaccharides (GOS) showing gut health promoting and immuno-modulatory effects in vitro and in vivo, might be able to reduce the adverse effects of thermal stress. This study aimed to investigate the potential effect of GOS on the heat-induced expression of HSP70 and HSP90, both in vitro in a Caco-cell model, and in vivo in chickens subjected to repeated heat stress.

Materials & Methods: Human intestinal epithelial Caco-2 cells were pre-incubated with GOS for 24h and then exposed to heat stress (40°C and 42°C) for 6 and 24h. For in vivo studies, chickens were selected due to their specific response to elevated temperatures, considering that they are an important target animal species, suffering from heat stress in countries with a high, tropical temperatures. The animals were pre-treated with GOS and exposed to heat stress (39-40°C) for 8h a day for 5 consecutive days prior to sampling. The induction of HSP70 and HSP90 were analysed by qRT-PCR and Western Blot analysis and their cellular localization visualized by immunofluorescence microscopy. Furthermore, in the in vitro studies, the mRNA expression of the oxidative stress marker, Heme Oxygenase-1 and protein levels of the apoptosis marker, Caspase-9 were investigated.

Results: Both in vitro and in vivo experiments confirmed that thermal stress significantly induces the expression of HSPs, measured by an increase in mRNA and in protein levels as an early response to heat stress. Pre-treatment with GOS could significantly prevent the heat-induced HSPs

up-regulation and production in mRNA and protein levels, respectively. Moreover, 42°C heat exposure resulted in an immediate up-regulation of the stress-marker HO-1, and GOS could dose-dependently suppress this induction. Heat stress exposure and GOS pre-treatment did not affect the apoptosis marker caspase-9 in Caco-2 cells.

Conclusion: In conclusion, results indicate that Caco-2 cell monolayers and chickens exposed to heat stress are valid models for the assessment of the effects of thermal stress. Moreover, our results clearly suggest that a pre-treatment with GOS exerts a protective effect against thermal stress in vitro as well as in vivo.

Keywords: Thermal stress, Heat Shock Proteins, GOS

Abstract No: 194

Triazole rizatriptan induces liver toxicity through lysosomal dysfunction

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Abstract

Background: Triptans are drugs used as antimigraine agents. Some cases of hepatotoxicity by triptans have been reported, however, the exact mechanism of triptan-induced hepatotoxicity has not been cleared yet. In this study, the cytotoxic effects of rizatriptan were investigated in freshly isolated rat hepatocytes.

Materials & Methods: We designed experiments according to Accelerated cytotoxicity screening technique (ACMS) to evaluate toxicity markers, such as cell death, reactive oxygen species (ROS) formation, lipid peroxidation, mitochondrial membrane potential, lysosomal membrane integrity and the amount of reduced and oxidized glutathione in the rizatriptan-treated hepatocytes.

Result: Cytotoxicity caused by rizatriptan in rat hepatocytes was dose-dependent. An increase in ROS formation accompanied by a significant rise in lipid peroxidation, mitochondrial depolarization and loss of lysosomal membrane integrity was observed. Cellular glutathione reservoirs were decreased and a significant amount of oxidized glutathione was formed.

Conclusion, it is suggested that the adverse effect of rizatriptan towards hepatocytes is mediated by oxidative stress and the hepatocytes lysosomes play an important role in the rizatriptan-induced cell injury.

Keywords: hepatotoxicity, rizatriptan, ROS, glutathione, lysosome, ACMS

This study was funded by Drug Applied Research Center of Tabriz University of Medical Sciences, Tabriz, Iran.

Cellular & Molecular Toxicology I

Panel Chair

Prof. N. Basaran

Panel Members

Dr. F. Ghaderi Pakdel

Dr. M.A. Eghbal

Key Lecturer

Dr. P. Akbari

Abstract No: 93 / Key Lecture

Deoxynivalenol: a trigger for intestinal integrity breakdown

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Abstract

Background: The aim of this study was to compare the adverse effects exerted by DON on the intestinal integrity in vitro as well as in vivo, to identify the molecular mechanism of DON toxicity and to establish a functional and reproducible model for forthcoming intervention studies.

Materials & Methods: Using an in vitro model with the human intestinal epithelial cell-line Caco-2 in a trans well system and an in vivo murine model, the effect of DON on Lucifer yellow (LY) and FITC-dextran paracellular transport and on tight junction (TJ) proteins (mRNA expression, protein concentration and their localization) was measured. Furthermore, histomorphometric analysis of the proximal and distal small intestines of treated mice was performed.

Results and Conclusions: Both in vivo and in vitro models demonstrated the impairment of the intestinal barrier induced by DON as reflected by a significant increase in the translocation of LY and 4 kDa FITC-dextran. At the same time, protein levels of different tight junctions were decreased accompanied by changes in the distribution pattern in vivo and in vitro. Histomorphometric analysis of intestinal specimen pointed out that DON-exposed mice showed a significant decrease in villus height, villus area and also in the epithelial cell area. Taken together, these findings support the understanding of adverse effects exerted by DON in vitro as well in vivo, while at the same time offering the possibility to use these in vitro and in vivo models for the evaluation of intervention strategies associated with an impairment of intestinal barrier function.

Keywords: Intestinal integrity, Mycotoxins, TEER, Tight Junction proteins

Abstract No: 201

Geomedicinal aspect of widespread geogenic arsenic in south-and-northeast Iran (Bijar and Chelpu) with its hazardous molecular immunotoxicity for inhabitants

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Abstract

Background: Geologically, arsenic (As) appears in water, feed/food and soil in Bijar and Chelpu districts, Kordistan and Khorasan Razavi provinces. Determination of as in macro-and-microenvironments in the region with its impact on some health and immunity were the purpose of this study.

Materials & Methods: As in soil/drinking water and urine/hair (n=56) was measured by ICP-MS and atomic absorption, respectively. Urine and hair samples were collected from individuals living in the area. Many questionnaires were completed and analyzed accordingly, and observed health disorders in human and animals, especially sheep, living in Bijar and Chelpu districts were recorded. Finally, in vitro, 20 ng/ml of As was exposed to human monocyte-derived dendritic cells (MoDCs) for 2h and gene and protein expression of key innate immune molecules, TLR2 and TLR4, was analyzed with qPCR and flow cytometry. As concentration in soil and water was 7000-6000 µg/Kg and 20-700 µg/l, respectively. With many related health disorders in inhabitants, urine as concentrations (µg/l) in human and sheep ranged 9-63 and mostly >1000, respectively (more severe in Bijar). Hair/wool as concentrations (µg/g) in human and sheep ranged 0.37-3.8 and 0.3-52, respectively. Compared to nontreated MoDCs, expression levels of both TLR2 and TLR4 genes and proteins were remarkably upregulated in As-treated MoDCs.

Results & Conclusion: Our finding shows that exposure to geo-genetic As not only deteriorates human's and animals' health but also causes immunotoxicity, and this immunotoxicity is partially caused through signaling on key TLRs. Molecular aspects of geogenic As versus geomedicine, health and immunity are being taken into deep consideration in Faculties of Veterinary Medicine and Science at Ferdowsi University of Mashhad.

Keywords: Arsenic toxicity, Drinking water, geogenic, Immunotoxicity, Toll-like receptors, dendritic cells

Abstract No: 155

Effects of Berberine on proliferation, cell cycle distribution and apoptosis of human breast cancer T47D and MCF7 cell lines

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Abstract

Background: Berberine, a naturally occurring isoquinoline alkaloid, has shown antitumor properties in some in vitro systems. But the effect of berberine on breast cancer has not yet been completely studied. In this study, we evaluated anticancer properties of berberine in comparison to doxorubicin.

Materials & Methods: The antiproliferative effects of berberine and doxorubicin alone and in combination were evaluated in T47D and MCF7 cell lines using MTT cytotoxicity assay. In addition, flow cytometry analysis performed to evaluate the cell cycle alteration and apoptosis induction in these cell lines following exposure to berberine and doxorubicin alone or in combination.

Results: The IC₅₀ of berberine was determined to be 25 μ M after 48 hours of treatment in both cell lines but for doxorubicin were 250 nM and 500 nM in T47D and MCF-7 cell lines, respectively. Co-treatment with berberine and doxorubicin increased cytotoxicity in T47D cells more significantly than in MCF-7 cells. Flow cytometry results demonstrated that berberine alone or in combination with doxorubicin induced G2/M arrest in the T47D cells but G0/G1 arrest in the MCF-7 cells. Doxorubicin alone induced G2/M arrest in both cell lines. Furthermore, berberine and doxorubicin alone or in combination significantly induced apoptosis in both cell lines.

Conclusion: Berberine alone and in combination with doxorubicin inhibited cell proliferation, induced apoptosis and altered cell cycle distribution of breast cancer cells. Therefore, berberine showed to be a good candidate for further studies as a new anticancer drug in the treatment of human breast cancer.

Keywords: Breast cancer, Berberine, Doxorubicin, Cytotoxicity, Apoptosis, Cell cycle

Abstract No: 411

Protective effects of fractions from *Artemisia biennis* hydroethanolic extract against doxorubicin- induced oxidative stress and apoptosis in PC12 cells

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Abstract

Background: This study was aimed at investigating neuroprotective effects of fractions from *Artemisia biennis* (A .*biennis*) hydroethanolic extract on oxidative stress and apoptosis induced by doxorubicin (DOX), a chemotherapeutic agent with neurotoxic side effects, in pheochromocytoma (PC12) cells. Treatment of cells with DOX reduced PC12 viability in a dose dependent manner.

Materials & Methods: For evaluation of the effect of fractions on DOX-induced cytotoxicity, PC12 cells were pretreated for 24 h with the fractions and then cells were treated with DOX. The fractions C and D protected significantly PC12 cells from DOX- induced cytotoxicity. Moreover pretreatment with active fractions for 24 h attenuated DOX-mediated apoptosis and the anti-apoptotic action of fractions was partially dependent on inhibition of caspase 3 activity and associated with increasing the mitochondrial membrane potential (MMP). Moreover selected fractions suppressed the generation of ROS and increased superoxide dismutase (SOD) activity.

Results: Taken together our observation indicated that subtoxic concentration of aforementioned fractions of A. *biennis* hydroethanolic extract has protective effect on apoptosis induced by DOX in PC12 cell.

Conclusion: The results highlighted that fractions C and D may exert neuroprotective effects through their antioxidant actions.

Keywords: Oxidative stress, Apoptosis, A. *biennis*, PC12 cell line

Abstract No: 502

Immunomodulatory effects of crocin in BALB/c mice

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Abstract

Background: During the last two decades, several studies have been done on the pharmacological-toxicological effects of *Crocus sativus*, commonly known as saffron and its active constituents. However, according to the literature, little is known to complete the perspective of how it treats our immune system. This knowledge is of great importance considering the introduction of saffron to clinical trials as an agent to treat cancer or depression.

Materials & Methods: Here, the effects of sub-acute (28 days) administration of crocin (5, 25 and 50 mg/kg) have been investigated in BALB/c mice. Body and organ weights, cellularity of the spleen, histopathological features, delayed type hypersensitivity (DTH) response, phagocytic activity, hemagglutination titer (HA), CH50, spleen lymphocytes subtypes and lymphocytes production and cytokines secretion have been evaluated.

Results: Based on our results, while there were no significant differences between crocin and normal saline considering body and organ weights, histopathological features, and cytokines secretion, crocin significantly potentiated DTH response and increased the population of cells with CD3 and CD4 markers.

Conclusion: Overall, it could be concluded that crocin (5, 25 and 50 mg/kg) enhances the power of cellular immunity and has no harmful effect on the immune system of BALB/c mice.

Keywords: humoral immunity, cellular immunity, crocin, saffron

Cellular & Molecular Toxicology II

Panel Chair

Prof. J. Fink-Gremmels

Panel Members

Prof. M. Ghazi-Khansari

Prof. A. Tsatsakis

Dr. J. Mehrzad

Key Lecturer

Prof. N. Basaran

Abstract No: Key Lecture

THE IMPORTANCE of BIOMONITORING of DNA DAMAGE in THE WORKERS FROM DIFFERENT OCCUPATIONAL SETTINGS

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Abstract

Despite the beneficial effects associated with the use of chemicals, workers in different occupational settings have the potential to be exposed to many hazardous chemicals such as solvents, pesticides, dusts, heavy metals which are known to be genotoxic. The accidental, occupational and environmental exposure to these substances used in industry and agriculture is still a continuing problem in many countries since the exposure of these chemicals have been associated with an increased risk for certain diseases including cancer. European Agency for Safety and Health at Work reported that occupational cancers reached to app. 10% of all cancer deaths. The developing countries have nearly three times higher incidence of occupational cancers than developed countries. The measurement of molecular or cellular biomarkers as the indicators of exposure or preventive factors is essential to predict the toxicity and has many applications in occupational toxicology. Although a variety of assays have been applied for biomonitoring to estimate the effects of human exposure to genotoxic agents, there is a need for reliable and fast method for screening workers professionally at risk in different occupational settings. The Comet assay, which has been regarded as a simple, inexpensive, reliable, rapid and trusted assay, is a reliable biomarker of genotoxic exposure and cancer risk. Antineoplastic drugs, ionizing radiation, pesticides, crystalline silica, formaldehyde and metals are some of the toxic chemicals that may pose potential hazards to occupationally exposed workers. In this presentation DNA damage that was assessed by Comet assay in some occupations specially in oncology nurses, radiology technicians, pesticide sprayers, foundry, pottery and plywood workers will be discussed. Work characteristics of exposed workers such as the use of protective equipments (gloves, masks, gowns, eye glasses) and ventilation hoods and existence of policies governing chemical exposure will also be presented.

Keywords: DNA, Worker

Abstract No: 54

Mechanism of protective effects of safranal (2, 3-Dihydro-2, 2, 6-trimethyl benzaldehyde) against hydrogen peroxide-induced cardiomyocyte toxicity

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Abstract

Background: It has been well documented that oxidative stress involved in pathogenesis of cardiac diseases. Previous studies have shown that safranal (2,3-Dihydro-2,2,6-trimethyl benzaldehyde), a major active constituent of *Crocus sativus* has antioxidant properties.

This study was designed to investigate protective effects of safranal against hydrogen peroxide (H₂O₂)-induced damage in H9c2 cardiomyocytes.

Materials & Methods: The H9c2 cells were pretreated 24 h with different concentrations of safranal and then incubated with 200 μ M H₂O₂ for 1 hour. Cell viability and the level of apoptotic proteins were determined using MTT and immunoblotting assays, respectively. The level of reactive oxygen species (ROS) and lipid peroxidation were measured by fluorimetric methods. Superoxide dismutase activity was determined based on the formation of formazan from phenyltetrazolium chloride after reaction with superoxide radicals.

Results: H₂O₂ significantly decreased cell viability which accompanied by increase of ROS production and lipid peroxidation and decrease of superoxide dismutase activity. Pretreatment with safranal increased viability of cardiomyocytes and could decrease the elevated ROS production and lipid peroxidation. Also, safranal was able to restore superoxide dismutase activity and to inhibit the reduction of antiapoptotic Bcl-2 protein and the elevation of apoptotic Bax and caspase-3 proteins.

Conclusion: Our data showed that safranal has protective effect against oxidative stress-induced cardiomyocyte damage and can be considered as a natural cardioprotective agent to prevent cardiovascular diseases in patients with high risk factors.

Keywords: Apoptosis; H9c2; H₂O₂; superoxide dismutase

Abstract No: 110

Evaluation of the mechanisms of hepatic injuries induced by antipsychotic drug Risperidone and hepatoprotective role of taurine and N-acetylcysteine (NAC)

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Abstract

Background: Risperidone, is a serotonin 5-HT₂ and dopamine D₂ receptor antagonist and widely used in the treatment of schizophrenia as an atypical antipsychotic drug. However, hepatotoxicity is one of its adverse effects reported in some patients. The mechanism(s) by which risperidone causes hepatotoxicity is not clear yet. This study was designed to investigate the exact mechanism of hepatocellular injury induced by risperidone as well as the protective effects of taurine and/or N-acetylcysteine (NAC) against this toxicity.

Materials & Methods: Hepatocytes were prepared by the method of collagenase enzyme perfusion via portal vein. The level of parameters such as cell death, ROS formation, lipid peroxidation (LPO), mitochondrial membrane potential (MMP), Lysosomal membrane integrity, cellular glutathione (GSH) content in the risperidone-treated hepatocytes were determined. Additionally, the mentioned markers were assessed in the presence of NAC and/or taurine.

Results: Incubation of hepatocytes with 400 μ M risperidone resulted in cytotoxicity characterized by an elevation in cell death, increasing ROS generation and consequently lipid peroxidation, impairment of mitochondrial function, hepatocyte glutathione (GSH) depletion and a change in lysosomal membrane integrity. Administration of 200 μ M NAC and/or 200 μ M taurine caused a reduction in amount of ROS formation and lipid peroxidation and also cell viability, mitochondrial membrane potential (MMP), GSH levels, lysosome membrane integrity were improved.

Conclusion: This study suggests that risperidone causes oxidative stress in hepatocytes and the protective role of taurine and/or NAC against risperidone-induced cellular damage is probably mediated through their reactive radical scavenging properties and their effects on mitochondria, lysosome and GSH levels.

Keywords: antipsychotic drug (risperidone), Hepatotoxicity, Reactive oxygen species, N-acetylcysteine, Taurine, Isolated Rat Hepatocytes

Abstract No: 94

Effects of low dietary levels of Deoxynivalenol on the function of the intestinal barrier of growing piglets

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Abstract

Background: The trichothecene deoxynivalenol (DON) is a mycotoxin that is found frequently in grains and grain products in moderate climate zones around the world. The adverse effects of DON have been described as reduced food intake and weight gain, and an impairment of the immune system and the intestinal integrity. The aim of this study was to evaluate the potential adverse effects of DON on intestinal barrier functions in piglets, which are considered to be the most sensitive animal species.

Materials & Methods: Piglets (n = 20) received either a commercial feed (controls) or the same feed contaminated with 0.9 mg DON per kg feed for 10 days. This exposure level was chosen as it represents the maximum permissible level according to Commission Recommendation 2006/576/EC. Weight gain was recorded and samples of different segments of the intestine were taken. Next to a histo-morphological examination, the effects of DON on epithelial tight junction was measured by qPCR alongside the duodenum and colon.

Results: DON negatively affected weight gain and induced alterations in the intestinal morphology. The mRNA expression of various tight junction proteins was increased, including the expression of claudin-2, ZO-1 in the duodenum and occludin as well as ZO-2 in the colon. This up-regulation can be regarded as a sign of activated repair mechanisms. Taken together our results indicate that even at this low concentrations, DON clearly exerts measurable alterations in the exposed animals that are of clinical relevance. These findings are in line with our previous observations in in vitro experiments and in functional experiments in mice, in which the impairment of the intestinal barrier function was accompanied by an increased paracellular transport of marker molecules that do not cross a healthy intestinal barrier.

Conclusions :The results of this low-exposure study are not only relevant for the assessment of adverse effects of DON in farm animals, but may also serve as an indication of adverse effects of chronic DON exposure in the human population, considering that the investigated mechanisms and results resemble alterations as observed in chronic inflammatory bowel diseases.

Keywords: mycotoxin, deoxynivalenol, weight gain, histomorphology, intestinal barrier,

Abstract NO: 386

The clofarabine effects on apoptosis induction and p53R2 gene expression in breast cancer cell line (T47D)

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3-Department of Parasitology, faculty of medicine, Tabriz university of Medical Sciences, Tabriz, Iran

Abstract

Introduction: clofarabine is a purine nucleoside analogue and inhibitor of ribonucleotide reductase enzyme complex (RR) that is used in treatment of blood cancers. Clofarabine-3P binds to RR and inhibits the conversion of NTPs to dNTPs. Low level of dNTP disrupts repairing and replication of DNA that results in induction of p53 and p53R2 subsequently.

Purpose: in this study we investigate the effect of clofarabine in induction of apoptosis in P53R2 expression and apoptosis in T47D breast cancer cell line.

Materials & Methods: T47D cell line was treated with different clofarabine concentration in three time: 24, 48 and 72h. Then by MTT assay the IC₅₀ of clofarabine was determined. After treating cells, total RNA of them was extracted and their cDNA was built by Reverse Transcriptase enzyme. Then Real Time PCR was done. The Annexine V and PI was used to detection of apoptosis by flow-cytometry method.

Result: IC₅₀ for 48 and 72h was determined as 3 and 2.5 μM respectively and the 24h treatment hasn't cytotoxicity on these cells. Clofarabine induces P53R2 expression in different time treatment of 48 and 72h. In 48h treatment P53R2 gene expression was 1.24 fold compared with control sample (1 fold), for 72h gene expression was 1.77 fold. Also the result of flowcytometry has shown 13.45 and 37.2 percent apoptosis induction for 48 and 72h treatment

Conclusion: With regard to the above finding, clofarabine can induces apoptosis through induction of P53R2 in T47D cell line, so it can be considered for more investigation as drug in breast cancer (epithelial cancer cells) treatment.

Keywords: apoptosis, breast cancer, DNA damage, gene expression

Abstract No: 184

Effect of KT5823 on spatial memory in rat model of Alzheimer's disease

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Abstract

Background: The role of nitric oxide/protein kinase G (NO/PKG) in neurodegenerative disorders is controversial in different circumstances. PKG affects neurons both by itself and as a result of increased NO concentration. In the present study, we examined the influence of PKG on spatial memory by studying effects of three different concentrations of KT5823 as a PKG inhibitor.

Materials & Methods: Morris water maze (MWM) was used for evaluation of behavioral alterations. We also measured the apoptosis and autophagy markers as two probable interfering pathways with PKG signaling by western blot method.

Results: We found that in A β -pretreated rats, intra-hippocampus infusions of 2.5, 5 and 10 (μ M/side) of KT5823 led to a significant reduction in escape latency and traveled distance comparing to A β -treatment group. Our molecular findings indicated that KT5823 could induce autophagy and attenuate apoptosis dose-dependently.

Conclusion: Here we can conclude that in addition to other parameters, apoptosis and autophagy in part have damaging and protective roles respectively in PKG signaling mechanisms. As autophagy-related proteins lose their functions in neurodegenerative diseases, we can claim that autophagy can be one of the therapeutic aims for remedy of Alzheimer's disease. This work was supported by funds from Tehran University of Medical Sciences.

Keywords: Amyloid beta; Apoptosis; Autophagy; KT5823; MWM; Protein kinase

Clinical Toxicology I

Panel Chair

Prof. M. Balali-Mood

Panel Members

Prof. B. Dalir Naghadeh

Dr. M. Dalirad

Dr. A.M. Sabz-Ghabaee

Key Lecturer

Dr. H. Hasanian Moghaddam

Abstract No: Key Lecture

Role of Case Finding in Outbreak Management: Lesson we've learnt

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Abstract

Background: Methanol poisoning particularly in epidemics is a potential threat. It can kill the patients rapidly, but finding a suitable triage strategy may limit casualties. The current study is present to discuss the role of case finding, national guideline and organizing all available resources for successful management of a methanol mass poisoning in Rafsanjan, Iran in May 2013.

Materials & Methods: Observational cohort study was designed to follow reviewed reporting records of hospitals; emergency medical services and the emergency operations center notes. Demographic data and the patients' final outcome (complete recovery, death or visual disturbances) was filled for every single patient. Descriptive analysis was used on all variables.

Results: A total of 694 patients presented to Emergency Departments of Rafsanjan after public announcement from May 29th to June 3rd, mainly via Short Message Service (SMS) and local radio broadcasting. More than half of this population (361 cases) were observed and managed in Rafsanjan and 333 were transported to the other medical centers in the province, including Kerman. The number of patients undergoing hemodialysis was 75 in Rafsanjan and 100 in Kerman, the main indication for which was metabolic acidosis refractory to metabolic blockade. There were 7 patients in Rafsanjan and 1 in Zarand which expired because of the intoxication. Except for the deceased cases, no serum levels for methanol were available and patients were managed according to history, physical examination, and serial blood gas analyses.

Conclusion: In countries like Iran, where diagnostic resources are limited, the use of active case finding besides following national guidelines and organizing all facilities available, can lead to successful management of such a high morbidity and mortality outbreak.

Abstract No: 256

Thallium Exists in opioid poisoned patients

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Abstract

Background: Thallium (Tl) is a toxic heavy metal that exists in nature. Tl poisoning may occur in opioid addict cases. This study was designed to evaluate the frequency and level urinary Tl in opioid abusers. In addition, clinical findings were evidenced.

Materials & Methods: One-hundred and fifty subjects were examined. Cases with history of at least 3 years abuse were admitted in Imam-Reza hospital as the case group; 50 non-opioid abusers from the target population were included as the control group. Twenty-four hour urinary qualitative and quantitative Tl analysis was performed on both groups.

Result: For all subjects, 128 (85%) were negative for qualitative urinary Tl, followed by 5% (trace), 7% (1+), 2% (2+), and 1% (3+). Mean (SD, Min–Max) quantitative urinary Tl levels were 14 (44, 0–346 µg/L). Mean urinary Tl levels in the case group were 21 (53, 0–346) and in controls were 1 (1, 0–26), which were significantly different ($P = 0.001$). The most frequent clinical findings were ataxia (86%), sweating (81%), and constipation (54%). In all cases ($n = 150$), mean (SD) with positive qualitative urinary Tl was 26.8 (12) and in negative cases was 2.3 (3.0), which were significantly different ($P = 0.002$).

Conclusion: This study showed that long-term opioid abuse might lead to Tl exposure. In opioid abusers with clinical manifestation of thallotoxicosis, urinary Tl should be determined.

Keywords: Thallium, opioid-like, poisoning

Abstract No: 123

Factors affecting the outcome of therapy in methadone poisoned patients in a Middle-Eastern (Iranian) referral University hospital.

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Abstract

Background: Abuse of opium and its derivatives is still a sizeable health care problem in the Middle East region. Agonist maintenance therapy with methadone is amongst the preferred remedies for treating opioid dependence and is increasingly supported by the regional governments in this part of the world. In this study we have investigated the clinical manifestations and factors affecting the outcome of therapy in patients with methadone poisoning in a Middle-Eastern (Iranian) referral tertiary care University hospital.

Materials & Methods: In this prospective and descriptive-analytic study which was done in a tertiary care and referral University hospital in Iran (2012-2013) all of the admitted patients with a clear and reliable history of methadone poisoning (n=433) were included and demographic data, Clinical status on admission including Glasgow Coma Scale (GCS), time elapsed from ingestion to hospital admission, average dose of naloxone used, any history of psychiatric disorder, type of toxic exposure, co ingestion of other medication, hospitalization time and the outcome were recorded and statistically analyzed.

Results: The average length of hospital stay was 33 ± 26 hours. 80.1% of patients had ingested methadone alone, and 90.3% survived. Complications were pulmonary edema (7%), aspiration pneumonia (1.4%), generalized tonic clonic seizure (0.9%), and renal failure (0.5%). GCS, systolic blood pressure and respiratory rate were lower in fatal cases and GCS had prognostic value for the outcome of therapy in methadone intoxicated patients. Patients with higher GCS on admission had better outcome [OR =0.47 (95% CI: 0.38-0.580); P value< 0.0001].

Conclusion: Admission time GCS maybe considered as an important predictor for the outcome of therapy in methadone poisoning.

Keywords: Methadone, Drug Overdose, Opiate Substitution Treatment

Abstract No: 403

Predisposing factors for deliberate self-poisoning in women admitted to poisoning treatment center of Taleghani hospital, Urmia, Iran

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Abstract

Background: Prevalence of self-harm or suicide has increased worldwide in recent decades. Deliberate self-poisoning is a common and easy way for attempted suicide, especially by women, in developing countries including Iran. Current survey aimed to evaluate the predisposing factors for self-poisoning in females.

Materials & Methods: In this cross sectional descriptive study, 200 female with deliberate self-poisoning were studied in Poisoning Treatment Center of Taleghani hospital, Urmia, Iran, in 2014. Data were collected using a checklist by interview and history taking from each patient. Demographic characteristics of patients, past history of psychosomatic disorders, substance abuse, domestic violence, previous suicidal attempts and the main motivation for suicide were investigated.

Results: The mean age (\pm SD) of studied women was 25.68 ± 9.27 years. Majority of patients (62.5%) were married, with average socioeconomic status (67%) and from urban areas (73.5%). Most of them were housewives (63.5%). Only 21.5% had academic education. Somatic and psychotic illnesses were reported by 14% and 26.5% of patients, respectively. Positive history of cigarette and/or opioid abuse was obtained from 21% of patients. Different degrees of domestic violence were experienced by 24.5% of the studied women. Sever stressful events was reported by 41% of patients and 20.5% had previous suicidal attempt. The most common predisposing factors for self-poisoning were conflict with husband (27.5%) or another family member (24%), psychological disorders (12.5%), emotional breakdown (8%), educational difficulties (1.5%) or economic problems (1%). The most common identified psychological disorders by consulting psychiatrists were depressive disorder (11.5%), personality disorders (10.5%), anxiety (3.5%) and obsessive-compulsive disorder (1%), respectively.

Conclusions: Our findings showed that many factors such as young age, undeveloped personality, low educational level, unemployment, stressful experiences, violent behaviors, psychosomatic problems, substance abuse and previous suicidal attempt may predispose women at the risk of suicide. To identify and resolve of these problems and also training life skills can reduce risk of suicide in women.

Keywords: Suicide, Poisoning, Risk Factors, Women, Iran

Abstract No: 30

Clinical Risk Factors in Botulism

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2-Cardiac Anesthesia Research Centre, Mashhad University of Medical Sciences, Mashhad, Iran.

3-Medical Toxicology Research Centre, Mashhad University of Medical Sciences, Mashhad, Iran.

Abstract

Background: botulism happens sporadically and in outbreaks in Iran. (1) It is rarely lethal. (2) This study has been performed to evaluate the epidemiology of botulism and to seek the potential clinical risk factors.

Materials & Methods: All cases with botulism admitted to Imam Reza Hospital, Mashhad, Iran from March 2008 to March 2013 were studied retrospectively.

Results: In total 52 cases were included. Among them, 52% were male with an average (SD, min-max) age of 29 (18, 3-75) years. Two cases (4%) died. Patients received 3.7 (2.4, 0.2-9) polyvalent antivenom. In addition, 11 cases received Anti B, 8 cases anti E and 4 cases anti A antivenom depending on their availability.

Duration of admission was significantly correlated with mydriasis ($P=0.011$) and dysphagia ($P=0.021$), but not with gender, dysarthria, movement disability or dyspnea. There were no statistically significant association between the antivenom doses and duration of admission, surviving, ICU admission.

Conclusion: botulism should be in mind in toxicology wards. Botulism is rarely lethal. In these patients, presence of mydriasis and dysphagia should be taken into account more seriously.

Keywords: Botulism, Risk factor

Clinical Toxicology II

Panel Chair

Dr. R. Hosseini

Panel Members:

Dr. H. Soraya

Dr. A.M. Sabz-Ghabaee

Prof. B. Dalir Naghadeh

Key Lecturer

Prof. M. Balali-Mood

Abstract No: Key Lecturer

Advances in treatment of organophosphorous poisonings

Mahdi Balali-Mood

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Abstract

Background: Organophosphorous (OP) compounds (OPs) are used and abused as pesticides, and chemical warfare nerve agents, respectively. Acute OP pesticide poisonings are common in some developing countries like Iran and Sri Lanka. Nerve agents were used during the Iraq-Iran war in 1983-88 and as terrorist attacks in Japan in 1994-95. OPs toxicities are mainly due to excessive cholinergic stimulation through inhibition of acetyl cholinesterase (AChE). Therefore, their acute poisonings reveal cholinergic syndromes (muscarinic and nicotinic). In severe intoxications, CNS and cardiovascular disorders are also observed.

Standard treatment: After decontamination, administration of atropine to counteract muscarinic over-stimulation, and an oxime to reactivate AChE are still standard treatment. Supportive and intensive care therapy including diazepam to control convulsions and mechanical respiration may be required.

Advanced treatment: Clinical investigations in Mashhad revealed that IV infusion of sodium bicarbonate to produce mild to moderate alkalinization (blood pH between 7.45 and 7.55) is effective in acute OP pesticide poisoning. Gacyclidine; an antiglutamatergic compound was also used in conjunction with atropine, pralidoxime, and diazepam in nerve agent poisoning. Intravenous magnesium sulfate decreased hospitalization period and improved outcome in patients with OP poisoning and is now under investigation. Bio-scavengers including fresh frozen plasma (FFP) or albumin have recently been suggested as a useful therapy through clearing of free organophosphates. Hemofiltration and antioxidants are also recommended for OP poisoning. Recombinant bacterial phosphotriesterases and hydrolases that are able to transfer OP-degrading enzymes are very promising in delayed treatment of OP poisoning. Recently, encapsulation of drugs or enzymes in nanocarriers has also been proposed.

Conclusions and recommendations: Updating of advances in treatment of OP poisonings is essential for Health professional particularly clinical toxicologists.

Keywords: Organophosphorous, poisoning, toxicity, treatment.

Abstract No: 136

Cement ingestion, a rare case of pediatric poisoning

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4-Imam Reza Hospital of Mashhad, Mashhad University of Medical Science, Mashhad, Iran

Abstract

Background: Acute poisoning of children is one of the most care need cause of their hospital admission. We report a rare pediatric case of cement ingestion.

Case: He was a 2 years old child who ingested unspecified amount of gray Portland Cement (PC) mixed with water because of his pry, seven hours before admission. He had drooling and burn sensation of his throat, without nausea, vomiting, respiratory distress, chest or abdominal pain and dysphagia. On physical examination, he had normal vital signs and mild erythematic pharyngeal mucosa. On abdominal X-ray he had a few dens particle, up to 10 mm, distributed on gastric, small bowel and right colon shadow. The esophogogastroic endoscopic finding on the next day reveled grade 1esophagogastritis with erythma of esophagus, cardia, fundal, body and antrum parts of gastric and normal duodenum. No PC residual was found in gastric tract until duodenum. Syrup of ranintidin was administrated and he was discharged when he completely tolerated oral diet and had defecation.

Conclusion: Children are high risk group for ingestion of hazard materials. Ingestion of PC can induce alkaline burning of gastrointrstinal tract.

Keywords: Cement, poisoning, children, case report, esophagogasteritis, chemical burn

Abstract No: 67

Co-treatment of rats by acetaminophen and deuterium depleted water can avoid tissue hurts

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Abstract

Background: One of the most important reasons of acute liver failure is acetaminophen poisoning resulted with its overdose. According to the records indicating the biological effects of deuterium depleted water (DDW), in this study, the effects of DDW on prevention of liver damages has been studied.

Materials & Methods: The mail wistar rats were divided to four groups (n=5) with 4 subgroups. All of the animals drink different waters for two weeks and treated with acetaminophen in day fifteenth. The rats in control group were given natural water receiving acetaminophen solvent (DMSO) (i.p) at day 15. The rats in acetaminophen group were given natural water and treated with acetaminophen (500 mg/kg bw , ip) at day 15. The rats in treatment groups drink DDW 30 and 60 ppm, respectively and treated with acetaminophen the same as previous group. At 4, 8, 16 and 24 hours after acetaminophen treatment, the blood was collected by heart puncture and the liver was removed. The level of biochemical factors such as aspartate amino transferase, alanin amino transferase, alkaline phosphatase and bilirubin were measured in plasma. Also, the activity of superoxid dismutase, glutathione peroxidase and glutathione reductase were measured in liver homogenate.

Results: The results showed that among the serum markers, the AST activity –as an indicative hepatocytes damage- was increased by acetaminophen. Also, acetaminophen injection led to the reduction of SOD, GPX and GR activities. Treatment of rats with 30 ppm DDW modulates the level of some parameters such as AST and SOD activities.

Conclusion: Treatment of rats with high dose of acetaminophen leading to liver oxidative injuries and DDW can prevent the development of damages.

Keywords: Acetaminophen, Deuterium depleted water, Liver damage

Abstract No: 305

Evaluation of clinical and demographic factors of the toxicity of pesticides in agriculture and social security referred to Imam Khomeini hospital of Ardabil in 1390

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Abstract

Background: Increasingly population growth resulted to increase needs to agricultural production and foods. Unfortunately today, in most countries, especially in developing countries, pesticides weapons (poison) and chemical fighting play major role in protection products, often due to inadequate knowledge of pesticide users with the principles of proper fighting, this work is done incomplete or irregular. We intended to evaluate clinical symptoms, demographic properties and several factors in poisoning caused by herbal pesticides in persons who referred to Emam Khomeiny and Sabalan hospitals in Ardabil province in 2011.

Materials & Methods: This study carried out on all patients who referred to Emam Khomeiny and Sabalan hospitals in Ardabil province in 2011 with pesticides poisoning. In this study individual properties (age, gender, residence place, job, marriage statues) pesticide type, poisoning cause, poisoning season, mental and physical disease back ground and clinical symptoms were evaluated in check lists. After completing check lists obtained data were entered in to SPSS v16 software.

Results: In this study 245 patients (184 and 61 cases were hospitalized in Emam Khomeiny and Sabalan hospitals respectively) were enrolled. Aluminum phosphide with 86 cases (35.1%) was the most common pesticide. Majority of patients with 162 patients (66.1%) were women, the age average of patients was 30.52 years and the most common age range was 20-30 years with 89 cases (36.3%). Summer season with 112 cases (39.7%) had the most reception; in 91 patients (77.95%) poisoning reason was intentional and the most common symptom was gastrointestinal in patients. 29.38% of patients with respiratory symptoms, 32.65% with neurological, 42.86% with ocular, 88.93% with gastrointestinal, 25.71% with cardiovascular and 7.75% with renal symptoms had referred.

Conclusion: As regard to morbidity, financial burden and morality, it is necessary that educational actions are done for protecting, proper usage to farmers, lack of availability, lack of storage in drink bottles and also applying labeled glassware for food storage.

Keywords: pesticides, poisoning, clinical symptoms

Abstract No: 84

Epidemiological and clinical characteristics of envenomation caused by snakes, scorpions and spiders in Tehran

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Abstract

Background: Envenomation is sometimes difficult to diagnose especially when there is no definite animal at the scene. The current study was done to compare different presentations of envenomation by snakes, spiders, and scorpions.

Cases were collected from hospital files during a 3-year (2010-2012) period in Loghman-Hakim Hospital. Diagnosis of envenomation was based on history and clinical presentations.

Materials & Methods: One-hundred and eighty envenomation cases with mean age of 32±16 years (range 2-78 years) and predominantly males (71.7%) had been admitted during this time period, of whom, scorpions, snakes, and spiders had attacked 91 (50.6%), 72 (40%), and 5 cases (2.8%), respectively. In 12 cases (6.6%), envenoming animal was unknown. Hand fingers, legs, and wrists were the most common involved parts (63, 37, and 28 cases, respectively). Fang marks were present in 68 out of 72 cases (94%). Pain, swelling, bruise, and muscle weakness were the most common signs. Of routine lab tests, platelet count, creatinine, and INR were significantly different among envenoming animals ($p=0.001$, 0.008 and 0.033, respectively)

Result & Conclusion: Lab tests and clinical presentations may be able to differentiate envenoming animals. Detailed examination of the bitten or stung parts are necessary to distinguish clinical effects of different animals and use appropriate anti-venom if applicable.

Keywords: clinical effects, envenomation, snakes, spiders, scorpion

Drug & Substance Abuse

Panel Chair

Dr. K. Soltaninejad

Panel Members

Dr. M.J. Hosseini

Dr. A. Fathi

Key Lecturer

Dr. T. Ghane

Abstract No: Key Lecture

Statistical report of pattern of poisoning admitted to four referral hospital in Iran in 2012 and 2013

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Abstract

Background: Having reliable information about poisoning cases can help Ministry of health for better management of poisoning in hospitals and also supplying antidote and equipments for them. Iran drug and poisoning information center has the responsibility of collecting demographic data of poisoned cases. The purpose of our study was to determine the pattern of poisoning with drugs and chemicals in 4 poisoning referral centers in Iran.

Materials & Method: This cross-sectional study was carried out by data collection from the medical records of patients who had attended the four poisoning referral centers in Tehran, Mashhad, Esfahan and Mazandaran during a two-year period between 2012 and 2013. The population under study was the patients hospitalized as a poisoned case. The variables in these records included age, sex, poisonous substance used.

Results: By studying 58973 poisoned cases in Loghman Hospital (Tehran), Imam Reza Hospital (Mashhad), Noor Hospital (Esfahan) and Mazandaran in 2013, Pharmaceutical poisoning is the main reason of Poisoning in all 4 centers. Drug abuse (opioids and stimulants consumption) is the second reason of poisoning in all centers. Between Chemicals poisoning, Pesticides and in Tehran, unfortunately Aluminum phosphide has the topmost prevalence of poisoning. Alcohol poisoning and animal bites are other reasons of poisoning in 4 hospitals.

Conclusion: It was seen that Pharmaceutical poisoning is the main reason of poisoning because of ease of access to them. So educational methods and promoting culture can help people to know about.

We can see between 15-64 years of age were more prone to suicidal poisoning with organophosphorous compounds in spring and summer and children of 1-4 years of age were more susceptible to accidental poisoning with household production and medicine. The incidence of poisoning by medicine higher as compared to last years in Iran. It is thus recommended that more preventive measures be taught to the general population.

Keywords: Drug poisoning, referral poisoning hospital

Abstract No: 318

Hypo and hyperglycemia among tramadol overdose patients in loghman hakim hospital, Tehran, Iran

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3-Forensic Medicine and Toxicology Department, Iran University of Medical Sciences, Tehran, Iran

Abstract

Background: Tramadol is a synthetic and centrally active analgesic. Hypoglycemia as another possible major side effect among abusers has not been known well.

Materials & Methods: Our objective is evaluation of the Blood Glucose Level (BGL) among tramadol-overdosed patients. This prospective cross-sectional study was performed from Feb to June 2013; BGL was measured at the time of admission, 8 and 12 hours later. All patients with hypoglycemia received infusion of 0.5-1gr/kg of hypertonic dextrose and their BGL was checked every hour until normal BGL. Patients' demographic, clinical and paraclinical data were collected. Totally, 128 patients with a mean (SD) age of 24.5 (6.9) years were recruited; 127 (99.2%) were male. Seizure occurred in 59.4% cases. Mean \pm SD admission BGL was 94.88 \pm 21.5mg/dL. Fourteen patients experienced hypoglycemia within 12 hours period. Hyperglycemia was experienced in 8 patients (6.25%) on admission day.

Results: There was no significant relation between the dose of tramadol and BGL.

Conclusion: In conclusion, hypoglycemia must be considered as an important side effect of tramadol-overdose. It is suggested that serial BGL monitoring in cases of Tramadol-overdose should be done for early recognition of hypoglycemia and its timely management. Also hyperglycemia may be revealed.

Keywords: Tramadol, hypoglycemia, hyperglycemia, blood glucose level.

Abstract No: 59

Effects of berberine on acquisition and reinstatement of morphine-induced conditioned place preference

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Abstract

Background: Berberine is an isoquinoline alkaloid, a major component of *Berberis vulgaris* extract, demonstrated to modulate the activity of several neurotransmitter systems like N-methyl-D-aspartate (NMDA) which is implicated in rewarding effects of morphine. In the present study, we investigated the effects of berberine on morphine-induced conditioned place preference (CPP) in mice.

Materials & Methods: Two different experiments were done. In the first place, the psychic tendency to morphine (acquisition phase) and in the second one, morphine craving and relapsing (extinction and reinstatement phases), were evaluated. Acquisition CPP was established by 40 mg/kg morphine injections and extinguished after extinction training and reinstated by a 10mg/kg injection of morphine.

Results: The results showed that administration of berberine (5, 10 and 20 mg/kg) did not induce conditioned appetitive or aversive effects. In the first method berberine (10 and 20 mg/kg) combined with morphine conditioning reduced acquisition of morphine-induced CPP. In addition, in the second method, berberine (10 and 20 mg/kg) significantly prevented the morphine reinstatement of morphine-induced CPP.

Conclusions: These results suggested that berberine can reduce the acquisition and reinstatement of morphine-induced conditioned place preference.

Keywords: *Berberis vulgaris*, berberine, conditioned place preference, morphine, opioid

Abstract No: 450

Acetylcodeine as a specific marker of illicit heroin: Clinical and forensic applications

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Abstract

Background: Heroin is the most commonly illegal opioid used worldwide. It has short half-life and it is rapidly metabolized to 6-monoacetyl-morphine (6-MAM) and then to morphine. Due to short half-life of heroin, analysis of 6-MAM is a critical role for differentiation of abuse of heroin from morphine in clinical and forensic settings. However, for diagnosis of use of pharmaceutical grade heroin from illegal heroin abuse during treatment program of heroin addicts and in forensic cases for detection of heroin in seized non-biological samples or for diagnosis of heroin abuse in suspect cases in pre- and post-mortem conditions, need to a suitable marker is necessary. The illegal heroin has many impurities and adulterations could be analyzed as a marker for heroin presence in biological and non-biological samples. Among these impurities, Acetylcodeine (AC) is a synthesis byproduct present in illegal heroin but not in pharmaceutical heroin may be considered as a marker for this proposes. The aim of this study is to determine the role of AC as a marker of illicit heroin in clinical and forensic cases.

Materials & Methods: We searched the Pubmed, Scopus and Google Scholar databases from 1990 up to March 2015. We used the following key words: Heroin, Illegal, Marker, Acetyl codeine. The searches were limited to English language articles.

Results: The results showed that the AC is a main component of illegal heroin. Therefore, it has a critical role for confirmation of use of illegal heroin in clinical and forensic cases. Analysis of AC in clinical and forensic bio- samples such as: blood, plasma, hair, nail, oral fluid, urine and non-biological samples with ultra-high-performance liquid chromatography (UHPLC), gas chromatography-mass spectrometry (GC-MS) and liquid chromatography -tandem mass spectrometry (LC-MS-MS) methods has a good relation with the use of illegal heroin.

Conclusion: AC is a suitable marker for diagnosis of street heroin with other components such as codeine, noscapine, morphine and 6-MAM in non-biological samples. AC would not make a suitable biomarker in place of 6-AM in hair because of its low concentration. However, AC detection in bio-samples such as blood, saliva and urine plays as a specific marker for confirmation of street heroin use both in clinical and forensic cases.

Keyword: Acetyl Codeine, Heroin, Marker, Forensic

Abstract No: 590

A Brief Review on Pharmacology of commonly Abused Drugs

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Abstract

Background: Drug abuse is a serious public health problem that affects almost every community and family in some way. Each year drug abuse causes millions of serious illnesses or injuries. Although some of the drugs mentioned in this review have been in use for centuries (e.g. caffeine, nicotine, cocaine), knowledge of their kinetics and metabolism is very recent and in some cases still incomplete. Kinetic characteristics also play an important role in the development of physical dependence and on the appearance of a withdrawal syndrome: the longer the half-life, the greater the likelihood of the development of physical dependence; the shorter the half-life, the earlier and more severe the withdrawal. Three major brain systems appear to be involved in drug reward—dopamine, opioid and GABA. As with many other brain diseases, addiction has embedded behavioral and social-context aspects that are important parts of the disorder itself. Therefore, the most effective treatment approaches will include biological, behavioral, and social-context components. This review studies the pharmacology and toxicology of commonly abused drugs, the effects of addiction on para-clinical consequences and any available statistics about the number of addicted people in developing countries.

Keywords: Abuse Drugs, Addiction, Withdrawal syndrome, Brain Systems

Emerging *in vitro* methods in Toxicology

Panel Chair

Prof. M. Ghazi-Khansari

Panel Members

Prof. J. Fink.Gremmels

Dr. M. Vardast

Key Lecturer

Dr. H. Yazdanpanah

Abstract No: 309

Chemometrics models for assessment of oxidative stress risk in chrome-electroplating workers

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Abstract

Background: Oxidative stress is the main cause of hexavalent chromium-induced damage in chrome electroplating workers. The main goal of this study is toxicity analysis and the possibility of toxicity risk categorizing in the chrome electroplating workers based on oxidative stress parameters as prognostic variables.

Materials & Methods: We assessed blood chromium levels and biomarkers of oxidative stress such as lipid peroxidation, thiol (SH) groups and antioxidant capacity of plasma. Data were subjected to principle component analysis (PCA) and artificial neuronal network (ANN) to obtain oxidative stress pattern for chrome electroplating workers. Blood chromium levels increased from 4.42 ppb to 10.6 ppb. Induction of oxidative stress was observed by increased in lipid peroxidation ($22.38 \pm 10.47 \mu\text{M}$ vs $14.74 \pm 4.82 \mu\text{M}$, $P < 0.0008$), decreased plasma antioxidant capacity ($3.17 \pm 1.35 \mu\text{M}$ vs $7.74 \pm 4.45 \mu\text{M}$, $P < 0.0001$) and plasma total thiol (SH groups) ($0.21 \pm 0.07 \mu\text{M}$ vs $0.45 \pm 0.41 \mu\text{M}$, $P < 0.0042$) in comparison to controls. Based on the oxidative parameters, two groups were identified by PCA methods. One category is workers with the risk of oxidative stress and second group is subjects with probable risk of oxidative stress induction. ANN methods can predict oxidative-risk category for assessment of toxicity induction in chrome electroplaters.

Results: The result showed multivariate modeling can be interpreted as the induced biochemical toxicity in the workers exposed to hexavalent chromium.

Conclusion: Different occupation groups were assessed on the basis of risk level of oxidative stress which could further justify proceeding engineering control measures.

Keywords: Oxidative stress, chrome electroplaters, Principle component analysis, artificial neuronal network.

Abstract No: 307

Increased protein SUMOylation in heart tissue of rats exposed to diazinon

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Abstract

Background: Small ubiquitin-like modifiers (SUMOs) are a family of Ubiquitin like proteins that are involved in a wide variety of signaling pathways. SUMOylation, as a post translational modification, is well known in Eukaryotic cells. Diazinon (DZN), an organophosphate insecticide, induces oxidative stress in different tissues also, causes programmed cell death. The aim of this study was to investigate patterns of proteins SUMOylation in rat heart tissue after DZN intoxication.

Materials & Methods: SUMO1-proteins of heart tissue lysate were, firstly, immune-precipitated and then separated on SDS-PAGE gel. Differently displayed protein species were identified using MALDI-TOF/TOF mass spectrometry.

Results: Our result showed that sumoylation of 4 key proteins, which involve in the metabolic process, including Acyl-CoA dehydrogenase, creatine kinase, glyceraldehyde-3-phosphatedehydrogenase and ATP synthase, were increased in the heart tissue of animals after subacute exposure to DZN.

Conclusion: It seems that protein sumoylation provides a safeguard mechanism against DZN toxicity.

Keywords: Diazinon, SUMOlation, SUMO1, MALDI-TOF/TOF

Abstract No: 332

Determination of 29 pesticides residue in olive oil in Tehran market by Gas Chromatography using Mass Spectroscopy Detection (GC-MS)

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Abstract

Background: Pesticides are one the most important group of food contaminants that different countries and international authorities have maximum identified permissible limit and continuous control of them in foods is essential. One of the consumable product in our country that produced traditional and manufacturing (internal and imported) is olive oil, which also are used in food and drug industry. Identification of permissible limit of pesticides in olive oil is depend on control and monitoring of their residue in foods by valid analytical method.

Materials & Methods: In this study, 29 pesticides residue in olive oil were developed and analyzed by GC/MS. Sample preparation were done by QuECHERS method with extraction by acetonitrile and clean up procedure by surface absorbent compound. For eliminating of matrix effect, calibration curve were drawn by using of spiked samples with calculation of portion AUC of pesticide residue to AUC of internal standard (triphenyl methane (TPM)). Based on our validation results calibration curves are linear in rang of 10-1500 ng/g and r² were upper than 0.994. Average of recoveries of all pesticides were in range between 77.97-112.65%. LOD and LOQ were 3-5 ng/g and 10-15 ng/g respectively. After method validation 37 real samples of commercially available in Tehran market were collected from randomly and analyzed for pesticide residue.

Results: Results showed that 29.7% of samples were contaminated by pesticide; 4 samples were upper than MRL and 7 samples below MRL.

Conclusion: According to the high content of pesticide in olive oil samples, it is necessary to control the amount of these pesticides in crude olive and imported olive oil commercially available in Tehran market.

Keywords: Pesticides; Olive oil; GC-MS

Abstract No: 60

Determination of toxic 1, 1-dimethylhydrazine by gas sensor based on polypyrrole-Ag nanocomposite

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Abstract

Background: 1, 1-Dimethylhydrazin (DMH) is primarily used as a high-energy fuel in military applications and as a rocket propellant and fuel for thrusters. Acute (short-term) inhalation exposure of humans to DMH results in nose and throat irritation, mild conjunctivitis, nausea, and vomiting. It is also highly corrosive and irritating to the skin, eyes, and mucous membranes. Liver damage in humans may occur from chronic (long-term) exposure to DMH. Carcinogenic effects have been observed in animals exposed to DMH by inhalation and orally, predominantly to the lung and liver.

Materials & Methods: Determination of DMH is carried out by spectrophotometry, GC or HPLC analysis but in this work we have analyzed DMH by a gas sensor based on polypyrrole-Ag (PPy-Ag) nanocomposite. Determination of DMH has been done very simple and quick in recent work. Electrically conductive fibers have been prepared by coating of Pyrrole-Ag on surfaces of commercial polymer fibers in the presence of an oxidizing agent. The resistance of PPy-Ag coated fiber sensor investigated and related to coating conditions, which was controlled by adjusting the reactant concentrations. The morphology of the conducting film on the surface of the fibers was examined by scanning electron microscope (SEM). The sensing behavior of PPy-Ag in the presence of some VOCs is studied experimentally.

Results: The PPy-Ag sensor had demonstrated good sensitivity for DMH (DL= 10 ng, LR= 10-200 ng) and good reproducibility when reused.

Keywords: Polypyrrole-Ag, gas sensor, 1, 1-dimethylhydrazine, toxicology, nanocomposite

Abstract No: 140

Determination of 5-Hydroxymethylfurfural in date syrup and comparison of its amount in samples produced by traditional and industrial manufacturing methods

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Abstract

Background: 5-Hydroxymethylfurfural (5-HMF) is a common Maillard reaction product and also is directly formed from dehydration of sugars under acidic conditions during heating and storage in carbohydrate rich foodstuff.

Materials & Methods: In the present study a HPLC method for determination of HMF in date syrup was developed and validated, and also the amount of HMF in date syrup samples produced by the traditional and industrial manufacturing methods were compared. In addition, to determine whether HMF was produced during storage in date syrup, the amount of it was measured in new and old samples. The optimum chromatographic condition was achieved by c 18 column (250×4.6mm; 5µm), acetonitrile/water(15/85;v/v) as mobile phase , isocratic condition with 1ml/min flow rate and UV detection in 285 nm. In this condition calibration curve was linear in the range of (0.2-1µg/ml) . The recoveries of HMF in spiked samples were found to be in the range of 90-110% .The LOD and LOQ were 0.03 and 0.187µg/ml respectively. The traditional and industrial products are divided into old (samples with production date more than 6 months) and fresh (samples with production date less than 1 month) samples.

Results: Our results indicated that the amount of HMF in the traditionally produced samples was significantly higher than industrial products ($p<0.001$) .This variation can be attributed to the quality of date and the heating process used by these methods. Moreover, the HMF content in old samples significantly was more than fresh ones ($p<0.001$). This finding indicate that amount of HMF is increased during storage.

Conclusion: In conclusion our study indicated that HMF was produce in date syrup during preparation and storage. Because HMF is recognized as an indicator of quality deterioration in a wide range of foods and on the other hand it is still under investigation for possible toxic effects, it is recommended that the amount of HMF was measured in date syrup and considered as an indicator of the quality control of this product.

Keywords: hydroxymethylfurfural (HMF); date syrup; HPLC; industrial, traditional, storage

Abstract No: 317

A green and simple method for determination of arsenic with graphite furnace atomic absorption spectrometry by using nickel modifier

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Abstract

Background: Arsenic pollution of foods has been reported in many developing countries, and it is therefore an important task to detect arsenic rapidly using a simple and inexpensive tool.

Methods & Martials: A highly sensitive and selective procedure for the determination of arsenate and total arsenic in food by electro thermal atomic absorption spectrometry was developed. The procedure is based on using 0.005% nickel as a chemical modifier in the presence of 100 mmol L⁻¹ nitric acid. The effect of pyrolysis and atomization temperatures of the graphite furnace atomizer, amount of nickel modifier and its concentration was investigated. . Under the optimal conditions, the calibration graph was linear in the range of 10-100 µg L⁻¹. The detection and quantification limits were 0.5 and 1.5 µg L⁻¹. Recovery values of between 74.5% and 94.7% were obtained for spiked samples.

Results: The accuracy of the method was evaluated by comparison with the results obtained for the analysis of a rice flour sample (certified material NCS ZC73008) and canned fish (certified material T0774) no significant difference at the 95% confidence level was observed.

Conclusion: This suggesting method could be used as a fast screening procedure for inorganic as determination in fish and rice samples.

Keywords: graphite furnace, atomic absorption spectrometry, arsenic, nickel modifier

Environmental Toxicology

Panel Chair

Prof. A. Basaran

Panel Member

Dr. A. Heidari

Dr. A. Mahdavi

Dr. M.A Shokrzadeh

Abstract No: 163

Effect of crocin on cadmium induced hepatotoxicity in rats

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Abstract

Background: Cadmium salts are considered to be an occupational hazard and were reported to produce undesirable effects in humans and animals. According to the several reports, oxidative stress is considered as one of the mechanisms involved in metal poisoning in sub-acute toxicity in different tissues including liver. Crocin, an active ingredient of saffron, has antioxidant properties. In the present study the protective effect of crocin in attenuating the toxicity induced by cadmium chloride in rat liver was investigated.

Materials & Methods: In this study cadmium chloride (5 mg/kg/day, gavage), crocin (10, 20 and 40 mg/kg, intraperitoneally) plus cadmium chloride, vitamin E (200 IU/kg, intraperitoneally, three times a week) plus cadmium chloride, crocin (40 mg/kg, intraperitoneally) and normal saline (negative control) were administered for 28 days to rats. Liver injury was evaluated by the measuring of the activities of serum hepatic enzymes namely aspartate transaminase, alanine transaminase, alkaline phosphatase, gamma glutamyl transferase, lactate dehydrogenase and total bilirubin along with oxidative stress markers, including the amount of malondialdehyde and glutathione content. Histopathological changes were also observed by light microscope.

Results: Our results showed that cadmium chloride increased the level of malondialdehyde, reduced the glutathione content and induced histopathological damages in rat liver. These effects were associated with increased the activity of alkaline phosphatase. Crocin (10 mg/kg) improved the damages induced by cadmium chloride.

Conclusion: Crocin, as an antioxidant, showed protective effects against liver toxicity induced by cadmium chloride.

Keywords: Crocin, saffron, cadmium chloride, lipid peroxidation, hepatotoxicity

Abstract No: 357

Plant allelochemicals and their interaction with insect metabolizing enzymes

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Abstract

Background: Allelochemicals are subsets of secondary plant metabolites, usually compounds of low molecular weight such as alkaloids, glucosinolates, and furanocoumarins. Structure and mode of action of plant allelochemicals are very diverse and play an important role in crop production and crop protection by their allelopathic effects on other plants, insects and other organisms. Allelochemicals are involved in both pest resistance in plants and pesticide resistance in pests (Mahdavi, Ahmad 1991). Plant- insect interactions including allelopathic effects are gen by gen coevolutionary phenomenon, started hundreds of millions years ago on the planet. Many herbivores including insects developed adaptations to feed and survive on plants containing highly toxic chemicals. Allelochemicals are easily detoxified in adapted insects, as by the mixed-function oxidases (MFOs) enzyme complex. The functioning of MFOs depends on cytochrome P-450 monooxygenases (also called polysubstrate monooxygenases). Mixed function oxidase enzymes have evolved as a protective mechanism against naturally occurring toxicants (Mahdavi, 1991).

Materials & Methods: this is a comprehensive study started in Canada and later continued in Iran. The first phase of the study in Canada was most conducted in laboratory involving solanaceous plants. The second phase of the study in Iran involved field and lab experiments with neem tree, *Azadirachta indica* in the Persian Gulf area. The objective of this comprehensive study is: using more pesticidal plants/ plant extracts (natural products) as alternative for dangerous synthetic pesticides and also discovery the boundaries of plant- insect- natural insecticide interactions.

Results and Conclusion: according to my observations and findings, toxic agents from plants stimulate and induce insect detoxifying enzymes within 24 h. This induction of insect detoxifying enzymes is nonhereditary. Plant allelochemicals found in different Solanaceous plants induced insecticide-metabolizing enzymes in insects. MFOs showed a graded response to increasing concentrations of allelochemicals. In phase 2 done in the Persian Gulf area and university of Mazandaran, the effects of Azadirachtin from neem trees was evaluated on different insect and nematode pest species. Plant allelochemicals may also act as synergists of insecticides. For example, myristicin, a Methylenedioxyphenyl (MDP) compound which is a common constituent of many umbellifer crops, is as effective a synergist of carbaryl as is piperonyl Butoxide. MDPs can be found in many plants grown commercially for food, and there is a possibility that insect-resistant cultivars may owe their resistance not to variation in levels of toxicant but rather to variation in levels of synergists.

Keywords: Allelochemicals, Secondary plant metabolites, Mixed- Function Oxidases, Methylenedioxyphenyl

Abstract No: 83

Determination of metal elements in muscle tissue of most consumed fish in central coast of the Caspian Sea in 2014

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Abstract

Background: The heavy metal pollution of the marine environment has long been recognized as a serious environmental concern. The levels of heavy metals are known to increase drastically in marine environment through mainly human activities. Fishes are good indicators for the long term monitoring of metal accumulation in the marine environment. Therefore the aim of this study was to determine the levels of cadmium, iron, manganese and lead in three most consumed fish species collected from the central coast of Caspian Sea.

Materials & Methods: Samples of fish were randomly acquired in local fishermen from cities across the central coast of Caspian Sea. These sampling sites of three regions of Caspian Sea coast –babolsar, khazarabad, and miankale. The three species (45 samples) included *Rutilus frisii kutum*, *Cyprinus carpio*, leaping mullet fish collected from three stations and then these were digested as per the standard of ASTM (2000). Concentrations of four metals (Cd,Pb,Fe,Mn) were determined using a flame atomic absorption spectrophotometer. The data analysis by Excel and SPSS 19 software's and t-test, ANOVA and Pearson's test.

Results & Conclusion: The results obtained show that the Concentrations of trace elements were found as Mn: 0.0034 ± 0.002 , Fe: 0.025 ± 0.028 , Cd: 0.0054 ± 0.005 , Pb: 0.0029 ± 0.002 mg/ kg, respectively. One-way analysis of variance (ANOVA) showed no significant difference in concentration of manganese ($P=0.3$), iron ($P=0.38$) and lead ($P=0.19$) in all three types of fish in the regions studied, while this difference was significant for cadmium in khazarabad ($P=0.027$) and miankaleh area ($P<0.007$). Pearson's test showed significant statistical correlation between these four metal concentrations in the selected fish species ($p<0.001$).

Keywords: Caspian Sea, *Rutilus frisii kutum*, *Cyprinus carpio*, leaping mullet, heavy metal, Atomic absorption spectroscopy

Abstract No: 532

Effects of Different Cooking Procedures on PCB and Organochlorine Pesticide Concentrations In fish species

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Abstract

Background: Environmental contamination by organochlorine pesticides (OCPs) and polychlorinated biphenyls (PCBs), which are representative persistent organic pollutants (POPs), is a serious problem for human beings. OCPs and PCBs have been produced and used for agricultural and industrial purposes for a long time and on a large scale. Because of their high chemical stability, long-range atmospheric transport, lipophilicity and persistence, these chemicals tend to bioconcentrate and biomagnify in the food chains and persist in the environment for many years, representing a definite health hazard for both wildlife and humans. Ingestion is the main source of human exposure to organochlorine pollutants, and, in particular, the consumption of seafood from contaminated areas. In several countries consumption of some fish species from polluted waters is not allowed because the concentrations of polychlorinated biphenyls (PCBs) exceed official tolerance limits. Few experiments have been carried out to assess if pre-treatment, such as cooking and frying would alter the PCB concentrations and maybe bring them under the tolerance limits. The aim of this Review was to determine the effect of food preparation such as frying and cooking on PCB and OCP concentrations.

Results: The PCB and OCP concentrations in the raw, boiled and fried fish species samples and the extraction percentages in the remaining broth and butter were showed, The average concentrations of PCBs and most OCPs increased significantly after frying. The increase in PCB and OCP concentrations is mainly explained by the decrease in moisture content.

Conclusions: There are a few differences in reports on this topic of preparation method effects on PCB and OCP concentrations in fish. No doubt, the type of fish, the length and character of the cooking process may have an influence on the results, anyway, Frying and cooking of polluted fish does not lead to decreasing concentrations of PCBs and OCPs and had no significant effect on the PCB and OCP concentrations. The loss of moisture is mainly responsible for the observed concentration effect. This shows that preparation methods for fish as food product do not help in bringing PCB and OCP concentrations down to safe values.

Keywords: Frying, Cooking, PCBs, Organochlorine pesticides

Abstract No: 431

Drying up the Lake of Urmia as a potentially toxic environment to making toxic dust storms

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Abstract

Background: The drying of lakes is a serious problem in the Middle East and Central Asia. The Lake of Urmia, the third saltiest lake in the world, lies in North-western Iran. The lake is being dried up and the reasons are apparent. A clear assessment of the relative roles of climate change (e.g. precipitation reduction, raised temperature) versus human intervention (e.g. dam making, excessive withdrawal of groundwater, land use change, particularly increase in farmland) has not been made. It is also clear that high PM (particulate matter) and toxic elements and chemicals are directly affecting human health.

Materials & Methods: So this research is comparing that after Urmia Lake drying up, all toxic elements, pesticides and herbicides will be definitely spread through the region as what is happening in surrounding areas of Aral Sea such as the increasing infant mortality rates, low birth weight, growth retardation, delayed puberty, acute respiratory diseases, water borne infectious diseases including typhoid and hepatitis A diseases, Malnutrition and anemia, Liver and kidney diseases, some types of cancer and very high levels of organochlorin pesticides, polychlorinated biphenyls (PCBs) and dioxins in blood and breast milk of people living beside Aral Sea.

Results: Hence, it is expected after drying up the Lake of Urmia, all mentioned problems will be seen and some natural hazards such as the dust storms that come off the former seabed absolutely are laced with salts and toxic chemicals carry those PM and toxic chemicals throughout the region easily.

Conclusion: Thus appropriate management of lands and upper stream catchments for preventing the lake from drying up because of the dust storm-prone is mandatory.

Keywords: Dust Storm, PM (Particulate Matter), Toxic Elements and Chemicals, the lake of Urmia,

Food Toxicology & Natural Toxin

Panel Chair

Dr. H. Yazdanpanah

Panel Members

Prof. J. F. Gremmles

Prof. O. Sabzevari

Prof. H. Malekinejad

Key Lecturer

Prof. J. Fink-Gremmels

Abstract No: Key Lecture

Risk Assessment of Mycotoxins in the Food Chain

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Abstract

Mycotoxins are among the most frequently occurring contaminants in cereal grains, nuts, grapes and wine fruits as well as spices and even coffee beans. Their worldwide occurrence and chemical diversity requires a substance-to-substance risk assessment, including potential adverse effects to human and animal health. It is the aim of this presentation to revisit the subject of integrated risk assessment, comprising the four elements of hazard identification, exposure assessment, hazard characterization and risk characterization.

Hazard identification is currently driven by original toxicological data relating to potential health risks in humans. In most cases convincing epidemiological studies are lacking, and if present, they are related only to the genotoxicity and potential carcinogenicity of mycotoxins. There is, however, an increasing body of evidence that other health concerns, such as subtle changes in the immune-competence (trichothecenes, ochratoxins, fumonisins), the disturbance of the endocrine homeostasis (zearalenone) and developmental aspects may be of human and animal health concern.

Exposure assessment links analytical data obtained from the control of food and feed materials to the actual exposure of humans and animals. An impressive progress has been made recently when EFSA (the European Food Safety Authority) implemented the comprehensive food consumption data base. This approach supports a quantitative exposure assessment (with attention for different age groups and high consumers), and reduces the gap between measurable toxin concentrations in raw materials and foods and the actual exposure of an individual. Recently a harmonized consumption pattern approach was also created for major farm and companion animals. Although the level of uncertainty in animal exposure assessment is still high due to the variability in animal diets, this approach improves significantly the transparency and supports risk characterization.

Hazard characterization: One of the most challenging parts of risk assessment is the dose-response assessment and the translation of data from (experimental) animals to humans. It requires an integration of toxicokinetic and toxicodynamic data and needs to identify the most relevant toxicological endpoints driving risk characterization. Hazard characterization includes a consideration of the (molecular) mechanisms of action (MoA) as well as (kinetic) factors that

determine the internal, biologically active dose. The translation from the measurable concentrations in food into the internal dose at a given target site requires insight into the factors that determine oral bioavailability and pre-systemic elimination processes, such as intestinal and hepatic biotransformation.

As mentioned before, for many years, mutagenic, genotoxic and the potential carcinogenicity of contaminants in the food chain have been considered as toxicological effects of highest concern, and are currently expressed by the margin-of-exposure approach (MoE). While this principle approach still serves risk prioritization, emerging endpoints such as immunological, endocrine and neurological alterations gain increasing attention in the assessment of food and feed contaminants. The final step of *risk characterization* needs to summarize the available evidence and should include an uncertainty analysis, as a signal to risk managers on the completeness of the data and the justification of the magnitude of the selected uncertainty factors. Risk characterization should also indicate the need for further exposure data, monitoring programs or toxicological investigations.

In conclusion, efforts towards a refined exposure assessment for both, human and animals, and improvement of hazard characterization have certainly improved transparency in risk assessment outcomes. More importantly, this stringent data analysis has resulted in the identification of scientific gaps in knowledge, such as the role of modified (masked) mycotoxins (Fusarium toxins) that contribute to overall exposure, the assessment of combined exposure to different classes of mycotoxins, as well as the contribution of mycotoxins to chronic human diseases, such as inflammatory bowel disease and allergies (deoxynivalenol). In the animal health assessment, economic losses due to chronic, low dose mycotoxin exposure, the species-differences in excretion patterns resulting in an unexpected contamination of milk and eggs (aflatoxins, enniatins), as well as the antimicrobial activity of many mycotoxins (Penicillium toxins), impairing rumen fermentation last but not least the immunosuppressive effects (trichothecenes, fumonisins, ochratoxin A), affecting the resistance to infectious diseases and impairing the results of vaccination programs, require consideration in forthcoming risk characterization and risk management approaches.

Keywords: Risk Assessment, Food

Abstract No: 284

Effect of different methods of decontamination on the level of aflatoxin B1 and ochratoxin A in the red pepper spice

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Abstract

Materials & Methods: Spicy red pepper samples that dried by the sun in the open air, randomly collected during the harvest period. Samples transferred to the laboratory under ambient temperature and evaluation of aflatoxin B1 and ochratoxin A were immediately performed on them. The dried samples without aflatoxin B1 and ochratoxin A were inoculate with this toxins and different methods of decontamination were used on them. In this study, two methods of physical methods including gamma irradiation and UV radiation and two methods of chemical methods including using of sulfur dioxide and ozone gas was used to evaluate their effectiveness in reducing aflatoxin B1 and ochratoxin an in red pepper. In order to achieve the best method of decontamination with preserve the physicochemical quality of pepper. Physico-chemical properties of the samples including moisture, total ash, ether extract, natural color (kapsantin), kapsaysin and volatile oils content were evaluated. Determination of Aflatoxins and Ochratoxin was performed with a high-performance liquid chromatography system using C18 reverse phase silica gel column with fluorescence detection and an automatic infusion pump. In general, the highest level of aflatoxin B1 and ochratoxin A was respectively measured in using of gamma irradiation method, ozone, UV radiation and SO2. On the other hand, the least negative changes on product quality characteristics was respectively measured in using of gamma radiation method, UV radiation, SO2 and ozone gas.

Results: The results on the effect of different methods of decontamination on mycotoxins content and physicochemical properties indicate that in Gamma irradiation method, addition of reduction of aflatoxin B1 and ochratoxin A amount to below the maximum permissible level, the least negative impact on the physicochemical properties of the product have also been observed.

Conclusion: Therefore, this method is superior to other methods and is recommended as an effective and safe method for the decontamination of product and reduce microbial load and mycotoxins in it.

Keywords: Aflatoxin B1, Ochratoxin A, Decontamination methods, Red pepper, Spice

Abstract No: 196

Cytotoxic effects of the crude venom and bioactive isolated fractions of two medically important scorpions from Iran, *Buthotus saulcyi* and *Odontobuthus doriae*.

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3-Razi Vaccine and Serum research Institute, Karaj, Iran.

Abstract

Background: Scorpion venom toxicity, was one of the major concerns for physicians in the past decades and researchers always tried to find the route of pathogenesis and defend against these effects. In Iran, the extent geographic parts and different weather conditions, made different species of scorpions, native. This is the reason that, from the bygone, there was a lot of researches on scorpions in this country. The old researches focused on the effects of scorpion envenomation and finding anti venoms for common species, but recent publications refers to the mechanism of scorpion toxicity, the role of scorpion toxin fractions in toxicity and finally the other possible biologic effects of scorpion toxin and its fractions. In the present study, we tried to define the cytotoxic effect of scorpion toxin and its fractions. The results will help us to find the pathogenesis of scorpion envenomation and will clear the role of scorpion toxin and its fractions in cell growth cycle.

Materials & Methods: We choose *Odontobuthus doriae* and *Bothutus Saulcyi* scorpions from the native species that made medical complications in Iran. We investigated the cytotoxic effect of the venoms of these two scorpions on different cell lines and primary cell cultures, which are involved in scorpion envenomation.

Results: The results showed that *Odontobuthus doriae* toxin, had a dose dependent cytotoxic effect on 1321N1 and DRG cell lines, that both of them were from neuronal origin. In the 1321N1, LC50 was 1 ug/ml and in DRG it was 10 µg/ml. In the next step, the fractions of *Odontobuthus doriae* toxin were isolated by chromatographic methods. 6 fractions were isolated and in vitro toxicity assay performed on mouse and fraction number 3 & 4 & 6 showed toxic effects. These fractions used for cytotoxicity assay on 1321N1 and DRG cell lines by MTT method.

Conclusion: Finally we found, the rather pure number 3 fraction, which has cytotoxic effect on 1321N1 and DRG.

Keywords: Cytotoxicity, *Odontobuthus doriae*, *Bothutus Saulcyi*

Abstract No: 427

Determination of aflatoxin B1 in Baby Food collected from Iranian market using by HPLC with post-column photochemical derivatization

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Abstract

Background: Aflatoxin B1 is the most toxic mycotoxin which is harmful to human and animals. The International Agency for Research on Cancer (IARC) classified it as group I of human carcinogens. Previous studies suggested that Infants and young children are much more sensitive than adults to the toxic effects of aflatoxin B1. Therefore, European Commission set the maximum residue level 0.1µg kg⁻¹ for AFB1 in baby food and processed cereal-based food (Regulation (EC) No. 683/2004).

Materials & Methods: In this study, for the first time we determined the amount of Aflatoxin B1 in baby food collected from Iranian market in 2015. The chromatographic condition was accomplished using a C18 column with an isocratic mobile phase consisting of water, methanol and acetonitrile. The sample preparation was done with simple extraction with water and methanol. Purification was carried out by immunoaffinity column cleanup and detection was done by post-column photochemical derivatization and fluorescence detector. The detection of AFB1 was carried out at λ_{exc} 365 nm and λ_{em} 435nm.

Results: Our results showed that this method is reliable and useful for routine monitoring of aflatoxin B1 in baby foods.

Keyword: Aflatoxin B1, Baby Food, HPLC, Iran

Abstract No: 164

Safranal considered as a safe compound to mice immune system

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2-Department of Pathology, Mashhad University of Medical Sciences, Mashhad, Iran

Abstract

Background: The aim of present study was to investigate immunotoxic effect of safranal (SAF), a main component of *Crocus sativus* essential oil, using Balb/c mice.

Materials & Methods: SAF was administered intraperitoneally at doses of 1, 0.5 and 0.1 ml/kg for 21 days. Hystopathological examination of spleen and bone marrow, cellularity of spleen, delayed type of hypersensitivity (DTH) response, hemagglutination titer (HA), cytokine production and lymphocyte proliferation assay were studied in various groups of animals.

Results: SAF at all doses could not produce any significant changes in spleen/blood cellularity, HA titer, DTH and lymphoproliferation responses, as well as in release of cytokines by isolated splenocytes.

Conclusion: Despite a few studies demonstrating some immunomodulatory effects for saffron extract, SAF as a major constituent of saffron did not induce any marked effects in immune system parameters of mice. Contrary to the toxicological studies which have indicated that SAF is more toxic than other active constituents in saffron stigma, at least it was found to be safe to mice immune system and has no toxicity on humoral and cellular immune responses.

Keywords: Safranal, Immunotoxic effect, Cellular immunity, Humoral immunity

Abstract No: 273

Mycotoxin detoxification ability of Lactic Acid Bacteria; a bio-approach

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Abstract

Background: Lactic Acid Bacteria (LAB) comprise a divers genera including Lactobacillus, Leuconostoc, Pediococcus, Lactococcus and Streptococcus, Carnobacterium, Enterococcus, Oenococcus, Tetragenococcus, Vagococcus, and Weisell. They found naturally in food and feed. Several potential health, technological and nutritional benefits have been proposed for LAB. Among them, detoxification ability represent a novel and interesting bio-approach to control and removal of different types of mycotoxins. The removal was characteristic of only specific strains with efficacy varying markedly. Some LAB strains proved highly effective in removing different types of mycotoxin in laboratory systems and in food products. The elimination mechanism is related to binding bacteria to toxin. The phenomenon has not been clarified yet, but in case of AFB1, it is suggested that the stability of the complex formed between bacteria and mycotoxin was influence by LAB strains, type of treatment and the extrinsic environmental conditions. Moreover, question remains on undesired effects of using non-native microorganisms with mycotoxin detoxification ability on food or feed.

Conclusion: In this lecture, I will clear some ambiguous features of this bio-approach such as the toxin binding per bacteria, the interaction of LAB and different types of mycotoxins, structural specification for binding and the effects of intrinsic and extrinsic environmental factors.

Keywords: Lactic Acid Bacteria; Mycotoxins; Detoxification

Genetic & Developmental Toxicology

Panel Chair

Prof. R.A. Sadrkhanlou

Panel Members

Prof I. Abdi

Dr. F. Shaki

Dr. M. Razi

Key Lecturer

Dr. M. Razi

Abstract No: Key Lecture

Natural Toxins and Reproductive disorders

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Abstract

Reproductive efficiency is the most important economic factor in livestock production. Thus, therapeutic agents, environmental pollutants, and natural toxicants are able to impact the reproductive potential at different levels including, hypothalamo-pituitary-gonadal regulatory axis, accessory sexual organ functionality, complex events involved in fertilization and implantation as well as embryonic fetal development. Lastly, mycoestrogens and xenoestrogens, as exogenous estrogen-like chemicals, are considered for their adverse effects on male endocrine status. In fact, several plants consisting high levels of estrogen and mycoestrogens are categorized in natural toxins anthology. Mycoestrogens are estrogens produced by various fungi. Phytoestrogens are plant-derived xenoestrogens not generated within the endocrine system but consumed by eating phytoestrogenic plants. Also xenoestrogens are called "*dietary estrogens*". Actually, xenoestrogens and mycoestrogens exert their effects primarily through binding to estrogen receptors (ER α and ER β). The ERs in interaction with aromatase (cytochrome P450 enzymes family), are involved in estrogen-induced pathways for controlling spermatogenesis and spermiogenesis process. These agents display somewhat higher affinity for ERs (ER β) versus endogenous estrogen (E2). It has been demonstrated that, binding of mycoestrogens and xenoestrogens initiate cascade of events known to follow estrogen stimulation. Different functional properties of natural and exogenous estrogens largely depend on their interaction with selected type of ERs. The endogenous E2 stimulates the ER α receptors that results in active cellular proliferation at spermatogenesis legions. Meanwhile, the ER β potentially promotes the apoptosis pathways. In the line with this issue, xeno-and mycoestrogens-induced high expression of ER β

leads to intensive arrest in cell division. In fact, the cyclins, c-myc and even E2F1 genes expression initiates under ER β -involved process, which in turn up-regulates the pro-apoptotic proteins biosynthesis. In conclusion, high serum concentration and accelerated delivery condition as well as resistant binding ratio of xeno-and mycoestrogens result in remarkable reduction in aromatization potency, dominant receptor binding and reduced ER α expression/biosynthesis, which in turn diminishes the fertilizing potential. Thus, controlled food storage/processing and programed consumption of phytoestrogens should be considered in developed populations.

Key Words: Xenoestrogen, mycoestrogen, Estrogen receptor, Spermatogenesis, Apoptosis.

Abstract No: 144

The effects of reproductive and behavioral toxicity of benzylparaben administered to maternal mice on adult female offspring

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Abstract

Background: Parabens are widely used as preservatives to inhibit microbial growth and extend shelf life of products in food, pharmaceuticals, cosmetics, sunscreens, skin-care products, conditioners, shampoos, soaps and deodorants. Recent reports demonstrated that parabens possess estrogenic activity in a range of assay systems in vitro and in vivo. Additionally, some recent studies have reported adverse reproductive effects of parabens.

Materials & Methods: The present study was aimed at evaluating potential reproductive and behavioral toxicities of benzylparaben (BP) as a paraben with estrogenic activity in Balb/c strain female mice. Female mice were administered orally with 0 (control), 3.3, 33 or 100 mg/kg/day benzylparaben (BP3.3, BP33 and BP 100), 20 µg/kg/day estradiol (E2) and maize oil (sham) from gestation day 7 through postnatal day 7 and vaginal opening, estrous cycle, lordosis behavior test and estradiol level were performed.

Results: As a result, vaginal opening was advanced in BP33, BP100 or E2-treated females. A vaginal smear indicated that control, sham and BP3.3-treated females showed a constant 4- or 5-day estrous cycle, whereas BP33, BP100 and E2-treated rats showed a persistent or prolonged estrus. Ovary histology was performed in all females at 60 days of age. The ovary weights in the BP100 and E2-treated groups were lower than those in the control. No corpora lutea were found in BP33, BP100 and E2 groups, except for two BP33 and E2-treated mice. BP33, BP100 and E2 groups showed a low lordosis quotient (LQ), being comparable to that in the control-treated females. On the other hand, estrogen level in the BP33, BP100 and E2 groups were higher than that in the control female group.

Conclusion: These results suggest that maternal administration of 33 and 100 mg/kg/day BP was effective in suppressing the functions of ovulation-inducing mechanisms, estradiol increase and the induction of lordosis and advancement of vaginal opening in the female offspring. The primary sites of action may be anywhere of hypothalamus-pituitary-ovary axis.

Keywords: benzylparaben, toxicity, reproductive and mice

Abstract No: 115

Cadmium Concentration in Blood Serum, Testicular and Epididymal Tissue of Slaughtered Rams and its effects on Sperm Quality and Testosterone concentration

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Abstract

Background: Chemical elements play a crucial role in male reproduction, as an unbalance in their amounts may lead to defective spermatogenesis, reduced libido, and consequently, male fertility impairment. The aim of this study was to evaluate relationship between concentration of cadmium in blood serum, testicular and epididymal tissues of slaughtered rams at Hamadan abattoir and sperm quality parameters, and serum testosterone concentration.

Materials & Methods: Testis and blood samples used for this study were collected from forty five rams (mehraban breed) from Hamadan abattoir. The viability, motility, and morphology characteristics of the cauda epididymal sperm was assessed by means of the Eosin-Nigrosin staining method. Testosterone concentration in blood serum was measured by ELFA. The blood serum, testicular and epididymal tissue samples were analyzed for the presence of cadmium by using a Flame Atomic Absorption Spectrometry (FAAS). Statistical analysis of results was carried out using the SAS software.

Results: The mean (\pm SD) of cadmium concentration in blood serum, testicular and epididymal tissues of rams were 0.15 ± 0.02 ($\mu\text{g/ml}$), 0.05 ± 0.08 ($\mu\text{g/g}$), and 0.22 ± 0.41 ($\mu\text{g/g}$), respectively. The mean serum testosterone concentration was 1.63 ± 2.19 (ng/ml). The correlation analysis showed a negative relationship between epididymal tissue cadmium and sperm viability, and positive correlation between testicular tissue cadmium and detached head and microcephalic sperm. High positive correlation between epididymal tissue cadmium and dead sperm ($r=0.424$), and detached head ($r=0.508$) was found. According to the statistical analysis, there was no significant correlation between testosterone and cadmium. Also, there was no association between cadmium and sperm motility.

Conclusion: The data obtained from this study indicated that cadmium in testicular tissue and epididymal tissue negatively affects the viability and morphologic parameters of spermatozoa and subsequently might cause reproductive alteration in male sexual functions.

Keywords: Cadmium, Ram, Testicular Tissue, Sperm Quality, Testosterone

Abstract No: 517

Combination of supercritical fluid extraction with Hollow fiber liquid-phase microextraction for extraction of organophosphorus pesticides from fruit samples

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Abstract

Background: Hollow fiber liquid-phase microextraction (HF-LPME) offers an efficient alternative to classical techniques for sample preparation and preconcentration.

Materials & Methods: In this work Supercritical fluid extraction (SFE) coupled with Hollow fiber liquid-phase microextraction (HF-LPME) and followed by gas chromatography-flame ionization detection (GC-FID) was applied for extraction and determination of ultra-trace amounts of two organophosphorus pesticides (OPPs) (diazinon and malathion) in fruit. Supercritical CO₂ at 150 bar, 60 °C, 10 min static and 30 min dynamic extraction times was used to extract the pesticides. For HF-LPME, a 2mL aliquot of the residual filtrate was placed in a 25 mL sample vial and ultrapure water was added to complete the volume. The factors affecting the HF-LPME of target compounds were investigated and the optimal extraction conditions were established. Under the optimum conditions, preconcentration factors in a range of 500–600 were obtained. The performance of the proposed method was studied in terms of linear dynamic ranges (LDRs from 0.02 to 100 ngmL⁻¹), linearity ($R^2 \geq 0.995$), precision ($RSD \% \leq 8.1$) and limits of detection (LODs in the range of 0.006–0.2 ngmL⁻¹). In addition to preconcentration, HF-LPME also served as a technique for sample clean-up.

Keywords: supercritical fluid extraction, Hollow fiber liquid-phase microextraction , organophosphorus pesticides

Abstract No: 504

Determination of residual pesticide diazinon, chlorpyrifos, cypermethrin in tomatoes and cucumbers in the market supply of urmia with dispersive liquid liquid microextraction

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Abstract

Background: Greenhouses tomato and cucumber in the market for supply has been sampled in order to determine the pesticide residues including diazinon, cypermethrin and chlorpyrifos. There are several methods in order to measurement of pesticides in these products. High-performance liquid chromatography is one of the conventional and accurate methods.

Materials & Methods: Under the optimum conditions; sample size, 5 mL; volume of dispersive solvent (methanol), 1.5 mL; extracting solvent (chloroform) volume, 250 μ L; and pH = 6, some analytical characteristics of the proposed DLLME method were calculated. Calibration curves are linear ($A = 1.343 C - 27.764$, A = peak area and C = concentration of chlorpyrifos in μ g L⁻¹, $A = 0.7895 C - 19.666$, A = peak area and C = concentration of Diazinon in μ g L⁻¹ and $A = 0.4244 C - 5.614$, A = peak area and C = concentration of cypermethrin in μ g L⁻¹) over the range 10 - 4000 μ g L⁻¹. Square of correlation coefficients (R^2) were obtained 0.998, 0.999 and 0.995 for chlorpyrifos, Diazinon and cypermethrin, respectively.

Results: The limit of detection (LOD) was calculated ($S/N = 3$) 2 μ g L⁻¹ for chlorpyrifos and 3 μ g L⁻¹ for Diazinon and cypermethrin. The relative standard deviation (RSD %) for six replicates of the experiment ($C = 500 \mu$ g L⁻¹) were 3.3%, 2.2% and 4.1% for chlorpyrifos, Diazinon and cypermethrin, respectively.

Conclusion: In this, a DLLME procedure combined with an HPLC method has been used to determination the OPPs in water samples, fruit juices and fruits. The method is simple, efficient and very rapid and it uses extracting solvent at a μ L-level. The proposed DLLME-HPLC method is applicable for analysis of the selected pesticides in aqueous samples and fruit juices.

Keywords: Residual pesticide, determination, microextraction, HPLC

Abstract No: 131

Chrysin Induces Apoptosis via Mitochondrial Pathway and ROS Formation on Isolated Mitochondria Obtained from Human Chronic Lymphocytic Leukemia

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Abstract

Background: Chronic lymphocytic leukemia (CLL) develops due to an imbalance between apoptosis and proliferation of B lymphocytes. Chrysin induced apoptosis in leukemia cell lines such as U937, MO7e, THP-1 and HL-60, but there any data regarding the apoptotic effect of chrysin on CLL lymphocytes. In this in vitro research we examined the cytotoxicity of chrysin against peripheral blood lymphocytes isolated from B-CLL patients and peripheral blood mononuclear cells (PBMC) from healthy individuals.

Methods & Materials: The effect of chrysin on viability of B-CLL cells obtained from CLL patients and PBMC from healthy subjects was determined by MTT assay. The type of cell death induced by chrysin was verified by Annexin V and propidium iodide double staining and flow cytometry assay (apoptosis% vs necrosis%). Intracellular ROS formation, mitochondrial membrane permeability collapse (MMP) and caspase-3 activity was determined by flow cytometry and fluorescence spectrophotometry. We isolated mitochondria form both groups (CLL patients and healthy subjects) and four mitochondrial toxicity parameters including collapse of mitochondrial membrane potential, mitochondrial swelling, reactive oxygen radicals formation and finally release of cytochrome c which is the start point of cell death signaling were then investigated.

Results: Our results showed that exposure of B-CLL cells to the chrysin concentrations of 20μM and higher selectively decreased viability of cells in this cell population, but not in the PBMC obtained from healthy subjects. Our findings demonstrated that chrysin induced ROS formation, mitochondrial membrane permeability collapse, mitochondria swelling and release of cytochrome

c from mitochondria into cytosol. This event led to activation of caspase-3 and finally induction of apoptosis of B-CLL cells.

Conclusion: Taken together, these findings suggest that chrysin selectively induces apoptosis on peripheral blood lymphocytes isolated from human CLL patients via mitochondrial pathway in vitro. This golden finding might have a promising role for a potential future antileukemic drug candidate.

Keywords: Chrysin, Apoptosis, Chronic Lymphocytic Leukemia, Mitochondria

Heavy Metals & Carcinogens

Panel Chair

Prof. I. Mohebbi

Panel Members

Dr. M. Delirad

Dr. E. Zadeh Hashem

Key Lecturer

Prof. M.H. Boskabadi

Abstract No: 296 / Key Lecture

The effect of lead exposure on respiratory system

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Abstract

Background: Lead is one that is highly toxic and has no known beneficial effects in the body. Although the respiratory system is the major target organ of lead-induced toxicity, the effects of environmental lead on respiratory system was documented in few studies.

Materials & Methods: The effect of exposure of guinea pigs to inhaled lead acetate was evaluated in sensitized animals to ovalbumin (OA), (group S), three non-sensitized groups exposed to three lead concentrations: (0.1M, 0.2M and 0.4M), three sensitized groups exposed to three lead concentrations during sensitization and three sensitized groups exposed to three lead concentrations post sensitization. There were significant and dose dependent increase in tracheal responsiveness to methacholine, OA, total and percentage of all blood and lung lavage total and differential WBC as well as IL-4, IFN- γ , ET-1, EPO, PLA2, histamine, NO and IgE in sensitized and all Pb-exposed groups compared to control group except percentage of lymphocytes and the of IFN- γ /IL-4 ratio which were significantly decreased in sensitized group and all Pb-exposed groups. Similarly, the effect of three concentrations of the lead on measured variables was significantly increased in sensitized groups compared to non-sensitized groups. In addition all measured values in sensitized animals exposed to highest lead concentration and most of them in animals exposed to medium lead concentration were significantly higher than those of low lead concentration ($p < 0.05$ to $p < 0.001$). The effect of three concentrations of the lead on measured variables was significantly higher in sensitized groups compared to non-sensitized groups ($p < 0.05$ to $p < 0.001$).

Results & Conclusion: Pathological finding in sensitized group exposed to highest lead concentrations was also increased ($p < 0.05$ to $p < 0.001$). This result showed that exposure to inhaled lead is able to induce respiratory changes similar to asthma. In addition, the results indicated that exposure to environmental lead pollution is able to aggravate asthma severity both during development of asthma or after it manifestation.

Keywords: Lead, Airway Responsiveness, Pathological changes, Lung inflammatory indices, Sensitized Guinea- pigs,

Abstract No: 99

Toxicity of Thallium on Isolated Rat Liver Mitochondria

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Abstract

Background: Thallium (I) is a highly toxic heavy metal; however, up to now, its mechanisms are poorly understood. The authors' previous studies showed that this compound could induce reactive oxygen species (ROS) formation, reduced glutathione (GSH) oxidation, membrane lipid peroxidation, and mitochondrial membrane potential (MMP) collapse in isolated rat hepatocyte. Because the liver is the storage site of thallium, it seems that the liver mitochondria are one of the important targets for hepatotoxicity. In this investigation, the effects of thallium on mitochondria were studied to investigate its mechanisms of toxicity.

Materials & Methods: Mitochondria were isolated from rat liver and incubated with different concentrations of thallium (25–200 mM). Thallium (I)-treated mitochondria showed a marked elevation in oxidative stress parameters accompanied by MMP collapse when compared with the control group.

Results: These results showed that different concentrations of thallium (25–200 mM) induced a significant ($P < 0.05$) increase in mitochondrial ROS formation, ATP depletion, GSH oxidation, mitochondrial outer membrane rupture, mitochondrial swelling, MMP collapse, and cytochrome c release.

Conclusion: In general, these data strongly supported that the thallium (I)-induced liver toxicity is a result of the disruptive effect of this metal on the mitochondrial respiratory complexes (I, II, and IV), which are the obvious causes of metal-induced ROS formation and ATP depletion. The latter two events, in turn, trigger cell death signaling via opening of mitochondrial permeability transition pore and cytochrome c expulsion.

Keywords: thallium (I); isolated mitochondria; oxidative stress

Abstract No: 377

Neuroprotective effects of cerium oxide nanoparticles against lead-induced neurotoxicity in rat hippocampus.

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Abstract

Background: Due to numerous industrial applications, lead has caused widespread pollution in the environment; it seems that the central nervous system (CNS) is the main target for lead in the human body. Oxidative stress and programmed cell death in the CNS have been assumed as two mechanisms related to neurotoxicity of lead. Cerium oxide (CeO₂) nanoparticles have recently shown antioxidant effects through scavenging the amount of reactive oxygen species (ROS) required for cell apoptosis. We looked into the neuroprotective effects of these nanoparticles against acute lead induced neurotoxicity in rat hippocampus.

Materials & Methods: We used three groups in this study: control, lead, CeO₂ nanoparticles + lead. Nanoparticles of CeO₂ (1000 mg/kg) were administered intraperitoneally during 2 days prior to intraperitoneal injection of the lead (25 mg/kg for 3 days). At the end of the treatments, oxidative stress markers, antioxidant enzymes activity, and apoptosis indexes were investigated.

Results: The results demonstrated that pretreatments with CeO₂ nanoparticles recovered lead-caused oxidative stress markers (ROS, lipid peroxidation, and total thiol molecules) and apoptosis indexes (Bax/Bcl-2 and caspase-3 protein expression). Besides, these nanoparticles reduced the activities of lead-induced superoxide dismutase and catalase as well as the ADP/ATP ratio.

Conclusion: Based on these outcomes, it appears that CeO₂ nanoparticles may potentially be beneficial for protection against lead-caused acute toxicity in the brain through improving the oxidative stress mediated programmed cell death pathway.

Keywords: Lead. Hippocampus. Neurotoxicity. Oxidative stress. Programmed cell death. Cerium oxide nanoparticles.

Abstract No: 474

The fetal growth restriction induced by cadmium is rescued by the endogenous Ah receptor ligand, 6-formylindolo [3, 2-b]carbazole (FICZ): Ah receptor and Wnt/ β -Catenin interactions in normal development

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Abstract

Background: The aryl hydrocarbon receptor (AHR), a key regulator of drug metabolizing enzymes responds to exogenous and endogenous chemicals by induction or repression of a large number of genes involved in several physiological processes. The Wnt/ β -Catenin, a highly conserved cell signaling transduction pathway is thought to be involved in every aspect of embryonic progress. Exposure to cadmium (Cd), an environmental pollutant leads to abnormal activation of the Wnt/ β -Catenin signaling, dis-regulation of AHR-associated genes and fetal growth restriction (FGR) in animal models. It is clear that maternal cadmium exposure induces FGR, but the underlying mechanisms remain largely unknown. The aim of this study was to test the hypothesis that AHR activation by 6-formylindolo[3,2-b]carbazole (FICZ), an endogenous ligand of AHR is needed for normal growth of embryos and to investigate how AHR interacts with the Wnt/ β -Catenin signaling pathway during early development of embryos.

Materials & Methods: Pregnant BALB/c mice received Cd (5mg/kg i.p.), an activator of Wnt/ β -Catenin, FICZ (100 μ g/kg i.p) alone or in combination at GD (gestation day) 9. In GD18 the animals were sacrificed by injection of thiopental (60 mg/kg i.p.) and the fetus malformations were evaluated.

Results & Conclusion: Our preliminary results showed that normal activation of AHR and Wnt/ β -Catenin are required for normal embryonic development however, our results at the moment are insufficient and limited to make a final conclusion from this hypothesis.

Keywords: Aryl hydrocarbon receptor (AHR), Wnt/ β -Catenin signaling pathway, Cadmium (Cd), Fetal growth restriction (FGR)

Abstract No: 82

Heavy metals (Pb, Cd) in the Tajan water way river, Iran

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Abstract

Background: Environmental pollution is a world-wide problem, heavy metals belonging to the most important pollutants. The progress of industries has led to increased emission of pollutants into ecosystems. Tajan is one of navigable river in the North of Iran. Along the Tajan agricultural industries units such as piping, steel, paint making, paper mill, fish cultivation, abattoirs, and electroplating industries drain their wastewater into the river.

Materials & Methods: In this study, the concentrations of heavy metals (pb, Cd) in the Tajan river have been determined. Samples were collected from 5 stations along the river, in autumn and winter 2004. Heavy metal concentrations were measured by graphite furnace atomic absorption spectrometry.

Results: The minimal and maximal concentrations of these metals in autumn were 21.3–82.7, 1.7–3.3 µg/l, for Pb, Cd respectively. The minimal and maximal concentrations of these metals in winter were 10.0–20.7, 1.44–41.25 µg/l for Pb, Cd respectively.

Conclusion: The results show that the pollution has increased along the river, down to the estuary at the Caspian Sea.

Keywords: Caspian Sea, Tajan River, Heavy metal, lead, Cadmium

Abstract No: 128

Luteolin starts apoptosis signaling in mitochondria isolated from hepatocellular carcinoma hepatocytes

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2 -Department of pharmacology Shiraz university, Shiraz, Iran.

Abstract

Background: Hepatocellular carcinoma (HCC) is a serious health problem throughout the world. Development of novel drugs without side effects for this cancer is crucial. Natural dietary agents have drawn a great deal of attention toward cancer prevention because of their wide safety margin. Luteolin (LUT), a bioflavonoid, some epidemiological studies suggest an inverse correlation between LUT intake and the risk of some cancer types. LUT can delay or block the development of cancer cells in vitro and in vivo by protection from carcinogenic stimuli and by induction of apoptosis via intrinsic and extrinsic signaling pathways.

Materials & Methods: Hepatocellular carcinoma was initiated by intraperitoneal injection of diethylnitrosamine (DEN) at 200 mg/ kg body weight for 2 weeks and promoted with dietary 2-acetylaminofluorene (2-AAF) (0.02%, w/w) for 2 additional weeks. Then rat hepatocytes were isolated with collagen perfusion technique and cancerous hepatocytes were sorted by flow cytometry. Finally mitochondria isolated from both cancerous and non- cancerous normal hepatocytes were tested for any probable toxic effect of LUT.

Results: Result of MTT assay showed that treatment with LUT (1–100 μ M) significantly decreased the viability of HCC hepatocytes in a dose and time-dependent manner. Our findings also showed that LUT (17.5, 35 and 70 μ M) -induced cytochrome c release only in cancerous (BUT NOT non- cancerous) which was subsequent of increased reactive oxygen species formation, mitochondrial swelling and disruption of mitochondrial membrane potential. Apoptotic effect of LUT on HCC cells was demonstrated by annexin V-FITC/PI double staining analysis followed by flow cytometry technique.

Conclusion: Taken together our results suggest as a potent anticancer candidate against HCC.

Keywords: Luteolin, Apoptosis, Mitochondria, Hepatocellular carcinoma.

Herbal Medicine & Toxicology

Panel Chair

Prof. J. Pourahmad

Panel Member

Prof. M. Maham

Dr. P. Mikaeili

Dr. H. Mohammadi

Key Lecturer

Prof. A. Basaran

Abstract No: Key Lecture

ADVERSE EFFECTS of HERBAL PRODUCTS

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Abstract

Since herbal products are often believed to be natural and therefore safe, their usage has increasingly become popular in recent years all over the world. However, a wide spectrum of toxicities have been associated with the use of herbal medicines and botanical dietary supplements, ranging from very mild to fatal, therefore it is essential to be aware of their safety, quality, and efficacy. The current simplified registration procedure in EU allows the registration of herbal medicines without requiring documentation on safety and efficacy. Lack of regulation of quality control and of product standardization makes it difficult to establish safe doses of herbal products in most countries. In many herbal products active substances may vary between batches and manufacturers. Some herbal products have been determined to be adulterated with undeclared conventional drugs such as sibutramine, sildenafil, and diazepam. Contaminants like lead, arsenic and cadmium have been an important problem. In some traditional herbal medicines, there is no regulatory need to assess the pharmacokinetic data. Herbal products may contain compounds which can be converted to reactive intermediates causing toxicity and they may cause significant interactions with concurrently taken conventional drugs and cause serious adverse effects. The use of herbal products by the elderly, by pregnant women, by patients about to undergo surgery and those with chronic diseases is of great concern especially when their doctors are unaware of these medications. In these presentations some adverse effects of commonly used herbal products will be discussed.

Keywords: Herbal Product

Abstract No: 206

Multiple protective mechanisms of *P. atlantica*, butyrate and *Lactobacillus casei* against trinitrobenzene sulphonic acid induced rat colitis model of IBD

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Abstract

Background: Inflammatory bowel disease (IBD), mainly comprised of ulcerative colitis (UC) and Crohn's disease, has high rate of incidence and lead to weakness in patients. Pistacia atlantica (*P. atlantica*) has a long history of use as a therapeutic agent with many reported medicinal properties. Butyrate, short chain fatty acid, can effectively treat distal ulcerative colitis, diversion colitis, and non-specific proctosigmoiditis in humans. Also, *Lactobacillus casei* (*L. casei*) as a probiotic has clinically shown modulatory effects on immune response and oxidative stress via production of anti-oxidant enzymes. The purpose of this study was to evaluate the effect of *P. atlantica*, butyrate, *L. casei*, and especially combination therapy, on colonic sensitivity in rats with 2, 4, 6-Trinitrobenzene sulphonic acid (TNBS)-induced colitis model.

Materials & Methods: Rats were divided into seven groups. Four groups received oral *P. atlantica*, butyrate, *L. casei* and the combination of three agents for 10 consecutive days. The remaining groups included negative and positive controls and a sham group. Macroscopic, histopathological examinations and biomarkers such as myeloperoxidase (MPO) were determined in the colon.

Results: The combination therapy exhibited a significant beneficial effect in improving the colitis compared to controls. Although the *P. atlantica*, butyrate, and *L. casei* were effective in reducing colon oxidative stress markers, but the combination therapy was much better in the improvement of colitis.

Conclusion: In this study we showed that combination therapy can reduce severity in various forms of intestinal inflammation and can even play role in modulation of gut microbiota in experimental colitis and maybe effective in future clinical trials.

Keywords: Ulcerative colitis, *Pistacia atlantica*, *Lactobacillus casei*, Butyrate, Myeloperoxidase

Abstract No: 237

Protective effect of tomato extract on H₂O₂-induced oxidative PC12 cell death

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Abstract

Background: Oxidative stress has been implicated as a major cause of cellular damages in neurodegenerative disorders such as Parkinson and Alzheimer disease. H₂O₂ is a reactive oxygen species that is produced during cellular metabolism. Lycopene is the major carotenoid present in tomatoes.

Materials & Methods: Tomato lycopene extract (TLE) has been demonstrated to show strong antioxidant effects. The aim of this study was to examine the protective effects of TLE on H₂O₂-induced cell death and apoptosis in cultured PC12 cells which have been widely used as in vitro model for neuronal cells. PC12 cells were treated with exogenous H₂O₂ (1 mM) and different concentration of TLE (0-20 µg) for 24 h at 37 °C. Cell viability was then measured by MTT assay. Annexin V / propidium iodide flow cytometry and DNA fragmentation assay were also used for the assessment of cellular apoptosis.

Results: The findings showed that H₂O₂ treatment decreased cell viability and increased apoptosis and DNA fragmentation in PC12 cells. TLE significantly increased PC12 cellular viability and attenuated H₂O₂-induced apoptotic cell death in a dose-dependent manner.

Conclusion: These results indicate that TLE may have the potential to protect oxidative stress-induced cell death and apoptosis in PC12 cells.

Keywords: Tomato lycopene extract, apoptosis, Oxidative stress

This study was supported by a Grant from the Vice-Chancellor for Research Affairs of Shiraz University of Medical Sciences, Shiraz, Iran.

Abstract No: 277

The Comparison of protective effects of pentoxifylline, Silybum marianum dried extract and Artichoke leaf dried extract in ketoprofen-induced liver and kidney damages

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Abstract

Background: Today, increasing number of people suffer nonalcoholic fatty liver disease (NAFLD), caused to finding new drugs. Among these attempts, herbal medicine which have less side effects draw more attention.

Materials & Methods: In this study, effects of pentoxifylline (200 mg/kg; PO), Silybum marianum dried extract (100 mg/kg; PO) and Artichoke leaf dried extract (1.5 g/kg; PO) in ketoprofen (2 mg/kg; SC)-induced hepatotoxicity and nephrotoxicity are surveyed in 40 male wistar rat within 8 groups. Protocol of treatment was done over 8 consecutive days. Hepatic enzyme activity (ALT, AST, GGT, and AP), total cholesterol, total proteins, lipid peroxidation levels (TBARS reaction), urea and histological changes in liver and kidney were measured.

Results: The results of ketoprofen group showed significant increase in hepatic enzyme activity and lipid peroxidation. The comparison of among treatment groups (artishock, silimarin and PTX) didn't show difference significant in hepatic enzyme activity, lipid peroxidation levels, but, every treatment groups had difference significant in comparison of ketopren group. Histopathological study showed some protective effect of Silybum marianum dried extract, artichoke leaf dried extract and PTX on liver and kidney tissues.

Conclusion: Plant extracts possesses substantial protective effect and antioxidant mechanism against ketoprofen-induced damages to vital organs of the body, hence it can be used as a protective drug.

Keywords: pentoxifylline, Silybum marianum, Artichoke leaf dried extrac, ketoprofen-iduced damages

Abstract No: 524

Preparing powder extracts of ginger (*Zingiber officinal*) turmeric (*Curcuma longa*) and black pepper (*Piper nigrum*), using nano- tech and determination of insecticides property rate of the extracts on aphids

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Abstract

Background: One of the most important factors and harmful agents in agriculture is insects. Non selective pesticides often use to control them as uncontrolled. Some efforts have been made to replace chemical insecticides with plant originated compounds to produce healthy products with low pesticides residues and providing insecticides compatible to the environment in recent years.

Materials & Methods: For this aim a plan has been made to produce three extracts of ginger (*Zingiber officinal*), turmeric (*Curcuma longa*) and black pepper (*Piper nigrum*) and determination of insecticides property rate of the extracts on aphides. For this, the plants were extracted. For making extracts into powder, convert to nano size and investigate particles size and forms used spray drier, ball mill and SEM respectively. Identification of agent groups and separation of compounds used with IR and GC respectively. The mortality of aphids due to the extracts was investigated after 5, 10, 15 and 20 minutes.

Results: The results for ginger extract were 68, 88, 94 and 100 percent, for turmeric extracts were 48, 60, 80 and 100 percent and for black pepper extracts were 20, 40, 80 and 100 percent respectively. Among these, the ginger extract had the best efficacy with the mean 87.5 percent.

Keywords: extracts,, ball mill ,spray drier,aphids

Abstract No: 531

Protective effect of pretreatment with Thymoquinone against Paraquat induced pulmonary toxicity in mice

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Abstract

Background: Thymoquinone (TQ), an active ingredient isolated from *Nigella sativa*, acts as a free radical and superoxide radical scavenger. The aim of the present study is to evaluate the protective activity of TQ against Paraquat (PQ)-induced pulmonary damage in mice.

Materials & Methods: Animals were randomly divided into nine groups and treated intraperitoneally. Group 1 (Blank), Groups 2 (negative control; solvent) and 3 (positive control) received vehicle, Group 4 treated with 20 mg/kg of TQ, Group 5 treated with 20 mg/kg of vitamin E, Groups 6, 7 and 8 were treated with 5, 10, 20 mg/kg of TQ and Group 9 with 20 mg/kg of vitamin E, respectively. After three consecutive days of pre-treatment, groups 3, 6, 7, 8 and 9 were administered with a single dose of PQ (20 mg/kg). All the animals were sacrificed 24 hrs following the PQ administration under ketamine/xylazine anesthesia. Biochemical parameters including LDH, Catalase in serum samples and total antioxidant capacity (TAC) and lipid peroxidation (LPO) levels in liver homogenates were determined.

Results: At the dose of 10 mg/kg TQ was more effective on PQ-induced lipid peroxidation; although the changes were not significant. At this dose, TQ significantly reversed PQ-elevated hydroxyproline to normal level that is in agreement with previous studies (8). The same manner was observed for LDH in agreement with other researches (9). On the other hand, Catalase activity did not change significantly by TQ at any of employed doses. Thiol group and FRAP tests were not affected by PQ and TQ.

Conclusion: It seems that the optimum dose of TQ is about 10 mg/kg. High dose of TQ (20 mg/kg) increased mortality and weight loss in animals and elevated hydroxyproline. Superoxide dismutase as an endogenous enzyme catalyzes dismutation of superoxide (O₂⁻) into oxygen and hydrogen peroxide. So they are elementary antioxidant defense in cells exposed to oxygen.

Keywords: Thymoquinone; Paraquat; Toxicity; Protection; Lung

Abstract No: 514

18 β -Glycyrrhetic acid disturbs the paracellular tracer flux and integrity of cellular monolayer in Caco-2 cells

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Abstract

Background: Licorice (*Glycyrrhiza glabra* L.) and its main component 18b-glycyrrhetic acid (GRA) have been widely used as a food flavoring and sweetening agent in diet. 18 β -Glycyrrhetic acid (3b-hydroxy-11-oxoolean-12-en-28-oic acid, GA), as a pentacyclic triterpenoid is known to exhibit a variety of pharmacological effects including anti-tumor, anti-hepatotoxic, and immunomodulatory activities. There are however, little is known about the effects of licorice compounds and in particular 18 β -Glycyrrhetic acid on paracellular flux processes and integrity of intestinal tract. Therefore, the current study aimed to highlight any impact of aforementioned compounds in Caco-2 cells.

Materials & Methods: Caco-2 cells were grown on 0.3-cm² high-pore-density polyethylene terephthalate membrane transwell inserts with 0.4- μ m pores. The cells were seeded at a density of 0.3×10^5 cells/insert. After 3 weeks of culture, a confluent monolayer was achieved, with a mean transepithelial electrical resistance (TEER) exceeding 400 Ω / cm². To evaluate the effect of licorice compounds on paracellular flux Lucifer yellow (LY) as a membrane-impermeable molecules was used and the permeability of LY was measured after 24 exposure to various concentrations of glycyrrhizin and two metabolites. The fluorescence intensity of LY in the basolateral compartment was measured with a fluorometer set at excitation and emission wavelengths of 410 and 520 nm, respectively. Moreover, the integrity of cellular monolayer was assessed by measuring the TEER at 0, 3, 6, 12 and 24 h after exposure to increasing concentrations

of licorice compounds. MTT colorimetric assay revealed that exposure of Caco-2 cells against the glycyrrhizin and its β and β - glycyrrhetic acid metabolites at 100 μ M concentration resulted in 22, 20 and 46% reduction in cell viability.

Results: LY flux was increased by 8, 13 and 30% after 24 h exposure to licorice and α and α -glycyrrhetic acid at 100 μ M, respectively. Mean TEER values only reduced significantly and time-dependently, when the cells exposed to 100 μ M β - glycyrrhetic acid.

Conclusion: Our data suggest that licorice compounds and in particular α - glycyrrhetic acid may cause intestinal disorders including cytotoxicity to enterocytes, disorganizing the cells junctions if it is used at over dose levels.

Keywords: Licorice Compounds; Lucifer yellow; Paracellular flux; Transepithelial electrical resistance

Nano-Toxicology

Panel Chair

Dr. M.K. Koohi

Panel Members

Prof. M. Ghazi-Khansari

Dr. S. Asri-Rezaei

Dr. F. Shaki

Key Lecturer

Prof. M. Ghazi-Khansari

Abstract No: Key Lecture

Neurobehavioral effect of Nanosilver in adult male offsprings

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Abstract

Nanoparticles can enter the body through inhalation in work place and are deposited into various tissues and organs including brain, where they may remain for long periods of time. Nanoparticles depending on their inherent properties, dose and duration of exposure and mode of administration (systemic or intracerebral routes) are shown to alter brain structure and function in laboratory animals. Nanoparticles can pass easily into cells and affect cellular function, depending on their shape and size. It has been shown that nanoparticles engineered from Ag or other metals when administered induce highly specific and selective neurotoxicity in the cerebral cortex, hippocampus, cerebellum, thalamus, hypothalamus and brain stem or spinal cord, a result of the breakdown of blood-brain barrier (BBB) permeability in those areas. Silver nanoparticles are the most common commercialized nano technological product on the market. Silver nanoparticles (Ag-NPs) are widely used in biomedical and commercial applications because of its antimicrobial advantages and have been incorporated into a number of consumer products such as clothing, kitchenware, toys and cosmetics. It is found that silver nanoparticles can traverse into the brain, and can induce neuronal degeneration and necrosis (death of cells or tissue) by accumulating in the brain over a long period of time. Toxic impact of Ag-NPs was attributed to its ability of inducing oxidative stress size-dependently. In this regard, we examined whether daily maternal exposure to Ag-NPs during gestational period is able to induce changes in behavior of adult male offsprings. Our study is shown that Ag-NP produces depressive-like behaviors as well as memory impairment in adult offsprings in animals. Overall, results of our study suggest that prenatal exposure to Ag-NPs may lead to neurobehavioral effect in later life.

Keywords: Neurobehavioral, Nano

Abstract No: 78

The Protective Effects of Nanoceria in Inhibition of mitochondrial oxidative damage in streptozotocin-induced diabetic embryos

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Abstract

Background: Gestational diabetes is defined as carbohydrate intolerance with onset or first recognition during pregnancy. It is now generally accepted that infants of diabetic mothers have a higher incidence of congenital anomalies. Between several mechanisms which suggested for diabetic complications, oxidative stress and mitochondrial damage are the most attention. Any disturbance in mitochondrial function leads to free radicals production and oxidative stress. In this study, we used nanoceria as an antioxidant to diminish mitochondrial damage for in embryo of diabetic mice.

Materials & Methods: The groups were divided into 5 which has 6 mice. Non-diabetic control mice, mice were treated with sodium citrate buffer, diabetic mice, diabetic mice treated with nanoceria for 4 weeks, mice treated with nanoceria. Diabetes was induced by injection of streptozotocin (60 mg/kg IP) that dissolved in citrate buffer (pH= 4.6). Blood glucose was checked in 1, 5, 10, 15 days of pregnancy. The diabetic state was confirmed when the blood glucose concentration exceeded 200 mg/dl. On the Day 16 of pregnancy, all animals were anaesthetized with ether and embryos were excised then oxidative stress parameters and MTT test was assayed.

Results: Significant increase in LPO, ROS formation and Significant decrease in GSH concentration and mitochondrial function was observed ($p < 0.05$). While, nanoceria administration remarkably prevented streptozocin-induced oxidative stress in isolated mitochondria of embryo in diabetic mice

Conclusion: Our research showed that diabetes can induce oxidative stress and ceria nanoparticles reduced mitochondrial damage in embryo of diabetic mice.

Keywords: diabetes, Nano ceria, oxidative Stress, mitochondria

Abstract No: 298

ZnO Nanoparticles induce serum CRP and IL-3 in rats with diabetes mellitus type I

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Abstract

Background: Zinc is an essential micronutrient and associated with more than 300 enzymes, and plays a key role in diverse biological processes including glucose metabolism. Zinc enhances hepatic glycogenesis through actions on the insulin signaling pathway and thus improves glucose utilization. Zinc oxide nanoparticles have great potential for medical applications. Current interest in ZnO nanoparticles is focused on their medicinal use and biological applications, including as a biosensor. Elemental metal nanoparticles can induce oxidative stress and apoptosis in various cell types. In this study, we synthesized ZnO nanoparticles and assessed their potential capability in inducing inflammatory reaction and as well as their possible association with cytotoxicity in liver.

Materials & Methods: 96 male rats (12 rats in 8 groups) were divided in 2 major group, including healthy and diabetic rats. Diabetes was induced by i.p. injection of STZ, and ZnO nanoparticles suspensions in saline (1, 3 and 10 mg/kg) were prepared and orally administered for 8 weeks. Blood samples were taken at 4 and 8 weeks and concentration of CRP and IL-3 as pre-inflammatory cytokine were determined in serum

Results: The results of this study revealed that in rats with T1DM insulin was significantly decreased whereas glucose and CRP and IL-3 levels increased ($p < 0.01$). Administration of ZnO induced CRP and IL-6 concentration in serum in dose dependent manner ($P < 0.01$). Also there was significant correlation between serum CRP and glucose concentration ($r = 0.67$, $P < 0.01$).

Conclusion: This research showed that the rats with T1DM have elevated basal levels of IL-3 and CRP. ZnO is the chemical constituent and found to be effective as inflammatory inducible agents and its administration increased CRP concentration in serum due to hepatotoxicity properties.

Keywords: ZnO Nanoparticles induce serum CRP and IL-3 in rats with diabetes mellitus type I

Abstract No: 88

Evaluation of the toxicity of MnO₂ nanoparticles on spermatogenesis in male rats

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Abstract

Background: MnO₂ has been used in industry for a long time, and nowadays its application in nanoparticle form is on the increase. The application of MnO₂ microparticles and nanoparticles in industry, medicine, and pharmacology has increased and, in consequence, human being's exposure to these particles has gone up. The rate of contamination with MnO₂ in environment is higher than that of other forms of Mn because MnO₂ is used as a substrate for the synthesis of other compounds of Mn. Also, in comparison to other forms of Mn particles, MnO₂ nanoparticles have a higher oxidation power. These nanoparticles have the ability to cross the blood-testis barrier and accumulate in the testis of rats, and they can have some specific side effects for this tissue. Therefore, the study of the possible side effects of the accumulation of MnO₂ nanoparticles in testis, such as disorders of spermatogenesis and reproductive system, is of great importance.

Materials & Methods: In this study, MnO₂ micro particles and nanoparticles (20-80nm) were injected (100µg/kg) subcutaneously to male rats once a week for a period of 4 weeks. The effects of these particles on body, testis, epidermal, and prostate weight; on the changes of testosterone and estrogen; on the FSH of serum; on the number of sperms, and the number of Spermatocyte and Spermatogonia cells, and on the diameter of Seminiferous tubes were measured as the criteria for spermatogenesis.

Results: The injection of MnO₂ microparticles and nanoparticles caused a significant decrease in the number of sperms. The evaluation of the serum factors and the testis tissue showed some changes in the normal function of the testis.

Conclusion: The chronic treatment of rats with both of the particles resulted in significant accumulation of manganese in testis, and caused impairment in spermatogenesis. It seems that the high oxidative power of these particles was the main reason for the occurrence of the observed disturbances in the tissues.

Keywords: Nanoparticles, MnO₂, spermatogenesis, testicular toxicity

Abstract No: 44

Maternal exposure to titanium dioxide nanoparticles impaired rat offspring memory and decreased hippocampal cell proliferation

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Abstract

Background: Titanium dioxide nanoparticles (TiO₂-NPs) are massively produced in living environment and because of their widely using, they have a potential risk to damage the human health. TiO₂-NPs are often used as additives for paints, papers, toothpaste, cosmetics and foods. Central nervous system including hippocampal regions is potentially susceptible targets for TiO₂-NPs. The aim of this study was to investigate TiO₂-NPs exposure during pregnancy on hippocampal cell proliferation and memory in the rat offspring.

Materials & Methods: Wistar pregnant rats were divided randomly into two groups: 1- Animals received TiO₂-NPs (100 mg/kg/ day, gavage). 2- Animals received distilled water via gavage. After delivery, one-day-old neonates were deeply anesthetized and sacrificed. Then their brains were collected from each group. The rat offspring brain sections were stained using Ki-67 immunolabeling by immunohistochemistry technique. Moreover Some of The offspring (n=12 for each group) were weaned and housed until adulthood (P60). Then the learning and memory in animals of each group were evaluated using passive avoidance and Morris water maze tests.

Results: Immuno-labeling of Ki-67 protein as a proliferating cell marker showed that TiO₂-NPs significantly declined cell proliferation in the hippocampus of offspring (P<0.05). Moreover, both Morris water maze and passive avoidance tests showed that TiO₂-NPs exposure significantly impaired learning and memory in the offspring (P<0.05).

Conclusion: TiO₂-NPs have neurotoxic effect on the hippocampus and Maternal exposure to these nanoparticles during pregnancy, decrease cell proliferation in the offspring brain and impair their learning and memory.

Keywords: Titanium dioxide nanoparticles, maternal exposure, Hippocampal cell proliferation, Learning and Memory, Neurotoxic

Part II: Poster Presentation of 13th Iranian International Congress of Toxicology

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Cellular & Molecular Toxicology I

Abstract No: 134

Another Anti-cancer mechanism for Thiazolidine-4-one compounds: Selective action on B lymphocytes Mitochondria obtained from Acute Lymphocytic Leukemia (ALL) Patients

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Abstract

Background: Natural products with a thiazolidine or thiazolidinone ring have cytotoxic, anticancer, antiviral, and antiinflammatory activities. Tubulin and microtubules are important so far recognized targets for anti-cancer thiazolidine-4-one compounds.

Methods & Materials: In this research the mitochondria mediated apoptotic effect of thiazolidine structured anti tubulin compounds was investigated on B- lymphocytes mitochondria isolated from patients diagnosed with acute lymphocytic leukemia (ALL). Thiazolidine derivatives inhibited the proliferation of B lymphocytes by inducing apoptosis in a concentration and time dependent manner. We isolated mitochondria from both cancerous and also Normal B- lymphocytes and then parameters of mitochondrial damage such as swelling, ROS formation; mitochondrial membrane potential decrease (MMP) and Cytochrome c release following administration of thiazolidine derivatives were investigated.

Results: Treatment with thiazolidine derivatives caused a rapid loss of mitochondrial transmembrane potential, accompanied by rise of reactive oxygen species (ROS), release of mitochondrial cytochrome c into cytosol, and subsequent activation of caspase 3, the final mediator of apoptosis in cancerous BUT NOT normal mitochondria and lymphocytes.

Conclusion: These results concluded that thiazolidine induced mitochondria ROS production leads to mitochondria-mediated death signaling that resulted in apoptosis in cancerous ALL lymphocytes. The selective mitochondrial induction of apoptosis by thiazolidine compounds may provide a parallel mechanism to its anti-tubulin anti-cancer effect in acute lymphocytic leukemia children.

Keywords: Thiazolidine, Mitochondria, Apoptosis, Tubulin, Acute Lymphocytic leukemia

Abstract No: 544

Molecular Analysis of Pyrethroid Insecticide Resistance Gene Alpha-subunit In the Human Head louse

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Abstract

Background: Pyrethroid insecticides are widely used to the control of pediculosis, the human head louse infestation. Increasing resistance of head louse to pyrethroid pediculicides during the last two decades is responsible for frequently reported treatment failures.

Methods & Materials: In order to identify additional sodium channel mutations potentially associated with knockdown resistance, full-length genomic DNA of IIS5 subunit were amplified and sequenced from head louse populations collected from schoolchildren and who are seeking treatment in Health Centres in an urban area of Iran. DNA was extracted from individual lice and used to amplification and sequencing of a ~900-bp fragment to detect the kdr-type mutations. A total of 20 head lice were analyzed.

Results: Sequence analysis results were presented in Congress. This was the first molecular survey on head lice pyrethroid resistance gene in Iran.

Conclusion: Further studies are now required to evaluate the prevalence of the kdr-like mutant allele in head lice in Iranian populations.

Keywords: Pediculosis, kdr resistance, PCR, Sequencing, Iran

Abstract No: 335

High glucose induced cytotoxicity on Human Umbilical Vein Endothelial Cells (HUVECs)

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Abstract

Background: In patients with diabetes mellitus, hyperglycemia plays a critical role in the pathogenesis of various complications, particularly in the process of endothelial dysfunction. Among all disorders associated with diabetes, micro and macrovascular complications are implicated in most conditions leading to morbidity and mortality in diabetic cases. In this study we examined the effect of high concentration of glucose (HCG) on endothelial cells viability and toxicity.

Materials & Method: HUVECs were grown in DMEM/F12 media supplemented by 10% FBS and 1% penicillin-streptomycin. Following 80-90% confluence, cells were detached by 0.25% Trypsin-EDTA and 1.5×10^4 cell/well were seeded in 96-well culture plates. Twenty four hours later, the cells were divided into two groups: a group (n=5) with normal glucose concentration and a group with high glucose concentration (30mM D-glucose; n=5). After 24, 48, 72 and 120 hours, the cell viability was assessed by both trypan blue exclusion test using a haemocytometer and MTT assay. Cell toxicity was also measured by lactate dehydrogenase (LDH) assay. Data were presented as mean \pm standard deviation (SD). Differences between 2 groups were analyzed using the student t-test, $p < 0.05$ is considered statistically significant.

Results: There were no significant differences in the viability and toxicity of the cells in the presence of normal concentration of glucose at different time points. However, high concentration of glucose caused considerable death of the HUVECs at different time points ($p < 0.05$). High concentration of glucose reduced the viable cell numbers to 26.29% after 72 hours ($p = 0.003$). Furthermore, LDH concentration in control groups was 52.54 U/L whilst it was remarkably high in medium of cells cultured in the presence of HG after 72 h ($p = 0.0001$).

Conclusion: Our findings highlighted that hyperglycemia, as a major factor to create diabetes complication, has toxic effect on human umbilical vein endothelial cell line compared to control group. This cytotoxic effect could be result of induction of ROS generation, autoxidation of glucose which produces advance glycation end products (AGEs) and reducing antioxidant potential.

Keyword: High Glucose Condition, Human Umbilical Vein Endothelial Cells, Cell Viability

Abstract No: 336

The effects of Silibinin and Quercetin on Human Umbilical Vein Endothelial Cells (HUVECs)

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Abstract

Background: Silibinin is a widely used flavonolignan from milk thistle and quercetin, is a bioactive flavonoid found in several edible plants. Many studies in rodents and cell cultures have shown that quercetin/silibinin exerts significant protection against different cancers by proper cytotoxicity. This study was designed to evaluate the effects of silibinin and quercetin, as two well-known flavonoids, on cell toxicity in human umbilical vein endothelial cells (HUVECs) at various concentrations and different time points.

Materials & Method: HUVECs were cultured in DMEM/F12 media supplemented by 10% FBS and 1% penicillin-streptomycin, after reaching to 80-90% confluency, cells detached by 0.25% Trypsin-EDTA solution and a number of 1.5×10^4 cell/well were seeded in 96-well culture plates. Furthermore, the cells were cultured in DMEM/F12 media containing 0.5% FBS with a panel of various concentrations of aforementioned drugs including 0, 0.1, 1, 10, 20, 50, 100, 200 and 400. Moreover, cell viability was further assessed by MTT test and cell toxicity was determined by LDH kit. Taken data were presented as mean \pm standard deviation (SD). Differences between 2 groups were analyzed using the student t-test, $p < 0.05$ is considered statistically significant.

Results: Corroborating to result, cell viability assessment revealed no significant differences among the vehicle groups at various time points. Quercetin-treated cells also showed no significant death or toxicity following 24 and 48 h post-exposure. However, the number of viable HUVECs in the presence of silibinin at 50, 100, 200 and 400 μ M were significantly diminished after 72 hour which reached a maximum value of 4.7% and 28.42% at 400 μ M of silibinin and quercetin, respectively. The LDH levels in treatment groups were significantly ($p < 0.05$) increased by high concentrations of the flavonoid at various time points.

Conclusion: The findings of current study indicated that the cytotoxicity level of two natural products on model of endothelial cells in different concentrations. Prominent cell toxicity was established at high concentrations in both silibinin and quercetin especially after 72 h.

Keyword: Silibinin/Quercetin, Human Umbilical Vein Endothelial Cells, Cell viability

Abstract No: 591

Cytotoxic effects of two P-glycoprotein inhibitors Ketoconazole and Silymarin on Caco-2 cells

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Abstract

Background: During the last decade we conducted numerous experimental studies to show various pharmacological effects of silymarin. Previous studies showed that silymarin is used largely as oral form. We in this study aimed to compare the possible cytotoxic effects of silymarin with ketoconazole as a known P-gp inhibitor -which is used also orally- on Caco-2 cell line as a model of the intestinal epithelium. To compare the possible cytotoxic effects of two substances on Caco-2 cells at concentrations corresponding to routinely used dose levels were selected and their effects were evaluated by endpoints including cell viability assay using MMT method, LDH and NO contents measurement in the cells supernatants by using commercially standard kit and Greise reaction respectively, and lipid peroxidation rate in exposed cells. Cell viability assay indicated that while silymarin at 25, 50 and 100 μ g/ml concentrations resulted in cell proliferation, ketoconazole showed no significant proliferation effect on Caco-2 cells. Ketoconazole at 30 and 60 μ M concentration resulted in cytotoxic effects, which was characterized by significant increase of leaked LDH and also remarkable elevation of malondialdehyde production in treated cells. Silymarin only at 100 and 200 μ g/ml concentrations caused a slight but significant increase of LDH. Our data indicate that although in the present study the P-gp inhibitory potency of two selected compounds was not evaluated, in terms of cytotoxicity, it seems ketoconazole exert considerably potent cytotoxic effect on Caco-2 cells, which it should be taken in account both in research proposals and also in clinical implications.

Keywords: Cytotoxicity; Intestinal Epithelium Cells; P-glycoprotein

Abstract No: 77

Simultaneous exposure to noise and formaldehyde and their effects on oxidative stress in blood and kidney tissue of rat

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Abstract

Background: Formaldehyde and noise pollution are detrimental stresses in workplace, which induce alterations of various physiological responses in exposed individuals. Simultaneous exposure of highly-used chemical and physical agents are expected to happen in many occupations. The aim of this study was to investigate the impact of co-exposure to noise and formaldehyde on oxidative stress in blood and kidney tissue of rat.

Methods & Materials: Animal study was conducted in the School of Public Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran. A total of 42 male Wistar albino rats were randomly divided into 6 groups (7 in each group). Rats in control group were not exposed to any stressor, while 2 groups were exposed to 6 and 12 ppm formaldehyde, 1 group to noise (0.7–5.7 kHz, 100 dB SPL) and 2 groups to noise + formaldehyde (8 h/d, 28 days). The level of oxidative stress in blood and kidney tissue were determined through GSH and MDA measurements. Sound pressure level was monitored using a calibrated Bruel and Kjaer 2238 sound level meter (Denmark). Formaldehyde concentration was monitored four times an hour by a photo ionization detector (Photocheck +5000, Ionscience Co., UK). GSH concentrations were measured through titration and quantification of thio-nitro-benzene using spectrophotometry at 412 nm. MDA levels were quantified by absorption at 535 NM wavelengths using a spectrometer.

Results: The results revealed that exposure to both stressors significantly reduced the GSH levels and significantly increased the MDA levels in exposed rats. The level of changes in groups with simultaneous exposure was dose-dependent ($p < 0.05$).

Conclusion: The current study clearly confirmed that co-exposure to noise & formaldehyde has an additive effect in oxidant /antioxidant system imbalance.

Keywords: Noise, Formaldehyde, Oxidative Stress, GSH, MDA

Abstract No: 109

Evaluation of the cytotoxicity mechanisms of Venlafaxine in Freshly Isolated Rat Hepatocytes

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Abstract

Background: Venlafaxine has an extensive worldwide application for treatment of depressive disorders. However, some cases of hepatotoxicity with this drug have been documented.

Materials & Methods: The potential molecular cytotoxic mechanisms of Venlafaxine towards isolated rat hepatocytes were investigated in this study using “Accelerated Cytotoxicity Mechanism Screening” techniques with freshly isolated rat hepatocytes incubated in Krebs-Henseleit buffer under a flow of 95% O₂ and 5% CO₂.

Results: The concentration of Venlafaxine evaluated to cause 50% cytotoxicity in 2 hrs was found to be 2mM. Venlafaxine caused a surge in reactive oxygen species (ROS) formation, malondialdehyde accumulation, depletion of intracellular reduced glutathione (GSH), rise of oxidized glutathione disulfide (GSSG). Furthermore, Venlafaxine cause a decline in the mitochondrial membrane potential (MMP) and an increase in lysosomal membrane leakiness which ended up to cell lysis. The addition of antioxidants such as N-acetyl cysteine, Taurine and Quercetine mitigated Venlafaxine-induced cell cytotoxicity, ROS generation, lipid peroxidation and depletion of cellular glutathione content. Also, antioxidants protected against Venlafaxine-induced MMP collapse and lysosomal damages.

Conclusion: Results from this study suggest that Venlafaxine-induced cytotoxicity in isolated rat hepatocytes may be partly due to ROS formation, GSH depletion and the subsequent cellular events that resulted in oxidative stress and mitochondrial and lysosomal injury.

Keywords: Venlafaxine, Hepatotoxicity, ROS, Mitochondrial damage, Lysosomal damage

Abstract No: 121

A comparison of toxicity mechanisms of cigarette smoke on isolated mitochondria obtained from rat liver and skin

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Abstract

Background: Previous studies demonstrated that CSE induces oxidative stress and its consequences on isolated mitochondria obtained from lung, heart and brain which may provide insight into the role of CSE in human health and disease. The present study was carried out to further characterize and compare toxic effect of CSE extract on isolated mitochondria obtained from either a directly contacting tissue (i.e. skin) and a vital visceral tissue (i.e. liver).

Materials & Methods: We obtained Rat liver and skin mitochondria by differential ultracentrifugation and incubated the isolated mitochondria with different concentrations (1, 10 and 100%) of standardized cigarette smoke extract (CSE). Our results were similar to our previous study which discovered CSE toxicity mechanisms on isolated mitochondria obtained from lung, heart and brain with minor changes. CSE induced significant rise in ROS formation, lipid peroxidation and mitochondrial membrane potential collapse and mitochondrial swelling on isolated mitochondria obtained from both liver and skin. CSE induced Decrease in ATP concentration on isolated mitochondria obtained from both liver and skin did not include CSE lowest concentration (1%).

Result & Conclusion: Our findings showed that CSE-induced toxicity in liver and skin is due to disruptive effect on mitochondrial respiratory chain which can leads to cytochrome c release and apoptosis signaling.

Keywords: cigarette smoking extracts (CSE); mitochondrial dysfunction; oxidative stress

Abstract No: 120

Production a fusion peptide from two antigenic parts of Clostridium perfringens epsilon toxin and Clostridium novyi alpha toxin for achieving higher immunity

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Abstract

Background: Clostridium perfringens epsilon toxin and Clostridium novyi alpha toxin are two important and potent toxins cause gas gangrene in humans and animals. Clostridium novyi alpha toxin with 250kd molecular weight belongs to the family of large clostridial cytotoxins which act on cells through the modification of small GTP- binding proteins. The epsilon toxin is made by Clostridium perfringens types B and D. This protein with 32kd molecular weight is a pore-forming protein causes potassium and fluid leakage from cells. According to the importance of these two toxins in human and animal's pathogenesis as mentioned above, vaccination against these two toxins seems crucial in Livestock industry. Multi-epitopic vaccination technology is a good alternative for toxoid vaccines and more cost effective. The goal of present study is to produce a fusion protein composed of epitopic regions of alpha and epsilon toxin.

Methods & Materials: The antigenic regions of alpha and epsilon toxins were identified by immunoinformatics tools. The specific primers were designed to amplify each fragment (antigenic region). The purified PCR product was digested by specific enzymes, and then ligated together with an appropriate linker designed by bioinformatic tools. The produced fusion DNA was cloned in pET32a (+) vector. The recombinant vector was transformed in E.coli (BL21). The positive clones were selected based on blue-white screening and were verified by PCR. A positive clone was inoculated in LB medium and expression was induced by IPTG. Immunological methods were used to confirm presence recombinant fusion protein.

Result & Conclusion: The fusion construct (1230bp) was verified by PCR and molecular biology methods. Immunological experiments were confirmed that the fusion protein is able to bind to antitoxin of both alpha and epsilon toxins. More studies need to be done for characterization of the fusion protein as well as production of anti-fusion protein. The new products (fusion protein and anti-fusion protein) can be used for diagnostic tests and vaccine candidate against two enterotoxemia and gas-gangrene.

Keywords: Clostridium novyi, Clostridium perfringens, fusion DNA, epsilon toxin, alpha toxin

Abstract No: 190

Myricetin and Kaempferol induce mitochondria mediated apoptosis on hepatocellular carcinoma hepatocytes in rat

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Abstract

Background: Despite the overwhelming progress in treatment of HCC, on a global scale HCC is still the third most common cause of cancer-related death. Flavonoids a group of phenolic compounds widely distributed in natural plants, and they have recently attracted much attention because of their pharmacological activities. Flavonoids such as myricetin and kaempferol commonly consumed in our diet in fruits, vegetables, tea, berries and red wine, have been reported to exhibit anti-cancer activity.

Materials & Methods: In this research, diethylnitrosamine (DEN) (200 mg/kg body weight i.p) was used as a hepatocarcinogen to induce HCC in experimental animals, and then cancer promoted by 2-acetylaminofluorene (2-AAF) (0.02 w/w) for two week. Biochemical parameters such as tissue damaging enzymes AST, ALT, ALP and histopathological changes have been estimated. Rat liver hepatocytes were isolated with collagen perfusion technique and cancerous hepatocytes were sorted by flow cytometry. The potential cytotoxic effects of myricetin and kaempferol on the hepatocyte obtained from DEN/2-AAF and normal treated groups were investigated by MTT assay.

Result: The results showed that myricetin and kaempferol were able to induce cytotoxicity in hepatocyte from DEN/2-AAF treated group in a dose- and time-dependent manner, according to the IC₅₀ value. Our results showed that myricetin (12.5, 25 and 50 μ M) and kaempferol (17.5, 35 and 70 μ M) induced reactive oxygen species (ROS) formation, mitochondrial membrane permeabilization (MMP), and mitochondrial swelling and cytochrome c release only in cancerous But Not non-cancerous mitochondria from hepatocyte. Apoptotic effects of myricetin and kaempferol on HCC hepatocyte was demonstrated by annexin V-FITC/PI double staining analysis.

Conclusion: Importantly, myricetin and kaempferol were non-toxic on non- cancerous hepatocytes, in vitro, underscoring its uses as therapeutic agents against hepatocellular carcinoma.

Keywords: Myricetin, Kaempferol, Apoptosis, Mitochondria, Hepatocellular carcinoma

Abstract No: 181

The protection of selenium-enriched medicines against chlorpyrifos-induced cytotoxicity via block oxidative stress and apoptosis in human lymphocytes

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Abstract

Background: Chlorpyrifos (CP) is a broad-spectrum organophosphorus pesticide used extensively in agricultural and domestic pest control, accounting for 50% of the global insecticidal use. In the present study, protective effects of two selenium-enriched strong antioxidative medicines, IMOD and Angipars, were examined in human lymphocytes treated with CP in vitro.

Materials and Methods: Isolated lymphocytes were exposed to 12 µg/ml CP either alone or in combination with effective doses (ED50) of IMOD and Angipars. After 3-day incubation, the viability and oxidative stress markers including mitochondrial activity (MTT), cell death modes (apoptosis vs. necrosis), cellular lipid peroxidation (LPO), myeloperoxidase (MPO), total thiol molecules (TTM), and total antioxidant power (TAP) were evaluated.

Results: Results indicated that CP-exposed lymphocytes treated with ED50 of IMOD and Angipars showed a significant decrease in the rate of mortality as well as the levels of oxidative stress. Also, these agents were able to protect CP-treated human lymphocytes from apoptosis and necrosis.

Conclusion: Taken together, the results indicate that IMOD and Angipars reduce the cytotoxic effects associated with CP through free radical scavenging and protecting from apoptosis.

Keywords: Human lymphocytes, Organophosphorus, Chlorpyrifos, Oxidative stress, IMOD, Angipars

Abstract No: 162

Evaluation of Suppressive Effects of Berberine on Immune System of Mice

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Abstract

Background: The immunotoxic effect of berberine (BBR), an isoquinoline alkaloid, was investigated using Balb/c mice. BBR was administered at doses of 5 and 10 mg/kg for 14 days.

Methods & Materials: Spleen weight/cellularity, delayed type of hypersensitivity (DTH) response, hemagglutination titer (HA), spleen cell subtypes, cytokine production, lymphocyte proliferation assay and histopathological changes were studied in various groups of animals.

Results: Results showed that high dose of BBR could suppress both cellular and humoral activity of the immune system. BBR at dose of 5 mg/kg just showed an immunotoxic effect on DTH response and lymphoproliferation assay. Therefore, it seems that BBR has adverse effects on mice immune system in dose dependent-manner.

Conclusion: In conclusion, BBR at high dose has an inhibitory effect on the cell-mediated and humoral immunity. Doses lower than 5 mg/kg of BBR seems to be an appropriate dosage for assessment of NOAEL, which is recommended by WHO experts committee for immunotoxicological considerations

Keywords: Berberine, Immunotoxic effect, Cellular immunity, Humoral immunity

Abstract No: 145

Invitro evaluation of effects of Zearalenone and α -Zearalenol on MCF-7 and MDA-MB-468 cell lines of human breast cancer

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Abstract

Background: In the field of human breast cancer, the most reports referred to the influence of endogenous estrogens and/or exposure to the estrogen mimetic agents, as risk factors. Zearalenone (ZEN) as a mycotoxin and its derivative α - zearalenol (α -ZOL) are known non-steroid estrogenic compounds with potential endocrine disrupting properties. The present study was designed to investigate the effects of ZEN and α -ZOL on MCF-7 cell line of human breast cancer and MDA-MB-468 estrogen receptor knock-out gene cell line of human breast cancer.

Methods & Materials: Cell lines were treated by low and high doses of ZEN and α -ZOL (0, 1, 30, 62, 125, 250 and 500 ng/ml and 1, 2, 4, 8, 15, 30, 62 and 125 μ g/ml) for 24 and 48 hours. Then, MTT colorimetric assay was used to evaluate the cytotoxicity effect of ZEN and α -ZOL. Furthermore, morphological changes of treated and untreated cell lines were studied under an inverted microscope.

Results: The results obtained from the present study were demonstrated that both ZEN and α -ZOL increase the cell viability of MCF-7 especially at low doses (1-500 ng/ml) and at a high dose of 125 μ g/ml after 24 and 48 h; however, this effect for α -ZOL was somewhat greater than that for ZEN. On the other hand, these estrogenic compounds didn't had any effect on the cell viability of MDA-MB-468. No morphological change were observed in treated cells.

Conclusion: In conclusion, these results indicate shows that ZEN and α -ZOL enhance the cell viability through the estrogen receptor and therefore exposure to this mycotoxin may increase the risk likelihood of breast cancer risk.

Keywords: Zearalenone, Breast cancer, MCF-7, MDA-MB-468

Abstract No: 132

Acacetin induces apoptosis in human chronic lymphocytic leukemia cells via mitochondrial pathway and production of reactive oxygen species

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Abstract

Background: Acacetin, which is a flavonoid compound, possesses anti-peroxidative and anti-inflammatory effects. In this study the effects of acacetin on cell viability in human chronic lymphocytic leukemia (CLL) cells and peripheral blood mononuclear cells (PBMC) from healthy individuals were investigated in vitro. The molecular mechanism of acacetin-induced apoptosis was also investigated.

Methods & Materials: We isolated mitochondria from lymphocytes obtained from both groups (CLL patients and healthy subjects) and parameters of mitochondrial toxicity such as collapse of mitochondrial membrane potential, mitochondrial swelling, the raise of active oxygen radicals and finally release of cytochrome c were investigated. The mode of cell death induced by Acacetin was characterized with Annexin V and propidium iodide staining assay (apoptosis% versus necrosis %) and caspase-3 activity final executioner enzyme in apoptosis was also determined by flow cytometry and fluorescent microscopy. This study demonstrated that acacetin significantly decreased viability of cells in CLL cancerous lymphocytes, but not in those of healthy subjects. Our results demonstrated that addition of acacetin could cause activation of caspase-3 activity. Furthermore, treatment with acacetin caused a rapid loss of mitochondrial transmembrane potential and mitochondria swelling. Rise of reactive oxygen species (ROS), release of mitochondrial cytochrome c were only occurred in mitochondria obtained from CLL patients BUT NOT in mitochondria obtained from healthy subjects. Acacetin also caused cytochrome c release from mitochondria isolated from CLL lymphocytes while pre-treatment with cyclosporine A (an inhibitor of MPT pore) or an anti-oxidant BHT (Butylated hydroxytoluene) prevented this effect.

Results: On the other hand, our results showed that acacetin-induced apoptosis selectively on CLL but not healthy lymphocytes and finally our results suggest that there is a link between ROS production and opening of MPT pores and mitochondria-mediated death signaling that justifies acacetin-induced apoptosis.

Conclusion: The induction of apoptosis by acacetin may provide a pivotal mechanism for its anti-cancer action.

Keywords: Acacetin, Apoptosis, Chronic Lymphocytic Leukemia, Mitochondria

Abstract No: 528

Effect of Gallic acid on complex 2 mitochondria isolated from the rat liver.

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Abstract

Background: Gallic acid is one of the phenolic acid compounds that are abundant in green tea and food supplements. It has antioxidant activity and antiproliferative effect on cancer cells. In our previous research, effect of Gallic acid on mitochondrial viability, we observed that the absorbance in 570 nm was increased. In MTT test utilizes the yellow tetrazolium salt (MTT) which is metabolized by mitochondrial dehydrogenase enzyme from viable cells to yield a purple formazan reaction product which was determined spectrophotometrically at wavelength of 570nm. Succinate dehydrogenase or Complex2 is one of dehydrogenase. In this study we investigate the effect of Gallic acid on succinate dehydrogenase as mitochondrial dehydrogenase.

Methods & Materials: Mitochondria was extracted from Sprague-Dawley rat's liver using differential centrifugation.. Mitochondrial protein concentration was determined by the Coomassie blue protein-binding method using BSA as the standard. The activity of mitochondrial complex II was assayed by measuring the reduction of MTT (3-[4,5-dimethylthiazol-2-yl]-2,5-diphenyltetrazoliumbromide). Briefly, 100 µl of mitochondrial suspensions (0.5 mg protein/ml) was incubated with different concentration of Gallic acid (0- 20 mM) at 37 °C for 20 min; then, 0.4% of MTT was added to the medium and incubated at 37 °C for 30 min. The product of formazan crystals were dissolved in 100 µl DMSO and the absorbance at 570 nm was measured with an ELISA reader.

Results & Conclusion: We observed increasing in Complex2 activity was dose dependent. So Gallic acid can increase in succinate dehydrogenase activity.

Keywords: Gallic acid, complex 2 mitochondria isolated, liver

Abstract No: 184

Effect of KT5823 on spatial memory in rat model of Alzheimer's disease

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Abstract

Background: The role of nitric oxide/protein kinase G (NO/PKG) in neurodegenerative disorders is controversial in different circumstances. PKG affects neurons both by itself and as a result of increased NO concentration. In the present study, we examined the influence of PKG on spatial memory by studying effects of three different concentrations of KT5823 as a PKG inhibitor.

Materials & Methods: Morris water maze (MWM) was used for evaluation of behavioral alterations. We also measured the apoptosis and autophagy markers as two probable interfering pathways with PKG signaling by western blot method.

Results: We found that in A β -pretreated rats, intra-hippocampus infusions of 2.5, 5 and 10 (μ M/side) of KT5823 led to a significant reduction in escape latency and traveled distance comparing to A β -treatment group. Our molecular findings indicated that KT5823 could induce autophagy and attenuate apoptosis dose-dependently.

Conclusion: Here we can conclude that in addition to other parameters, apoptosis and autophagy in part have damaging and protective roles respectively in PKG signaling mechanisms. As autophagy-related proteins lose their functions in neurodegenerative diseases, we can claim that autophagy can be one of the therapeutic aims for remedy of Alzheimer's disease. This work was supported by funds from Tehran University of Medical Sciences.

Keywords: Amyloid beta; Apoptosis; Autophagy; KT5823; MWM; Protein kinase

Abstract No: 548

Minocycline attenuates depressant-like effect induced by organophosphate pesticide Malathion in mice: Involvement of L-arginine/nitric oxide/cyclic guanosine monophosphate pathway

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Abstract

Background: Organophosphate pesticides such as Malathion may lead to a variety of neurobehavioral actions such as depression and anxiety. This study was performed to investigate the antidepressant-like effect of sub-acute minocycline in male mice in sub-acute exposure to Malathion, and possible involvement of nitric oxide (NO)/cGMP pathway.

Methods & Materials: Mice were administered Malathion once daily for 7 consecutive days at doses of 25, 50, 100 and 250 mg/kg, i.p. After the administration of effective dose of Malathion (250 mg/kg), different doses of minocycline were injected alone or in combination with non-specific nitric oxide synthase inhibitor, L-NAME, an NO precursor, L-arginine, and selective phosphodiesterase type 5 inhibitor, sildenafil. After assessment of locomotor activity in open-field test (OFT), immobility time was recorded in the forced swimming test (FST) and tail suspension test (TST) to assess the depressive-like behavior. Moreover, serum levels of NO were determined in the selected animal groups.

Results: In the present study, statistically significant differences among the groups the studied with blood levels of calcium and magnesium metals, with total antioxidant capacity, with some biochemical Parameters, blood as well as some neuro-cognitive responses, mental health and quality of life there.

Conclusion: The investigation indicated that Malathion exposure evokes depressive-like behavior. The role of NO/cGMP pathway in the antidepressant-like effect of minocycline in the mouse FST and TST was confirmed. Also it might be suggested that interaction of nitrergic and cholinergic systems are involved in malathion-induced depression.

Keyword: Malathion, Minocycline, Depression, Nitric oxide, Mouse

Abstract No: 34

Protective effects of simvastatin on Sodium dichromate (Cr (VI)) induced Lung Toxicity

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Abstract

Background: chromium (Cr (VI)) is an environmental and industrial pollutant that can induce a broad spectrum of harmful effects on various organs in humans and animals. The ultimate goal of occupational health is prevention of health hazards on workplace. Occupational exposure to chromium VI can result in pulmonary toxicity. There are evidences showing properties of simvastatin (SIMV) including anti-inflammatory and anti-oxidant activities. The aim of this study was to determine the effect of simvastatin (SIMV) on sodium dichromate (Cr (VI))-induced pulmonary toxicity in rats.

Materials & Method: Adult, male rats were received (ip) injection of Cr (VI) at doses of 8, 12, 16 mg/kg. Simvastatin treatment (20 mg/kg/day) was applied for 12 consecutive days, starting 4 day before CrVI administration. 24 hours after last experiment, all animals were killed with over dose of sodium pentobarbital. Lung tissues were excised for measuring malondialdehyde (MDA), glutathione (GSH) and histopathological examination.

Results: The level of GSH significantly decreased. In contrast, the lung level of MDA significantly increased in a dose dependent manner in CrVI-treated rats, when compared to control animals. SIMV significantly increased GSH concentration and decreased MDA level in CrVI-treated rats.

Conclusion: The results of this study supported the potential protective effects of SIMV on rat lung tissues against Cr (VI) toxicity.

Keyword: Simvastatin, sodium dichromate, Malondialdehyd, Glutathione, Rats.

Abstract No: 509

Chronic treatment with metformin suppresses toll-like receptor 4 signaling and attenuates left ventricular dysfunction following myocardial infarction

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Abstract

Background: Acute treatment with metformin has a protective effect in myocardial infarction by suppression of inflammatory responses due to activation of AMP-activated protein kinase (AMPK). In the present study, the effect of chronic pre-treatment with metformin on cardiac dysfunction and toll-like receptor 4 (TLR4) activities following myocardial infarction and their relation with AMPK were assessed.

Methods & Materials: Male Wistar rats were randomly assigned to one of 5 groups (n=6): normal control and groups were injected isoproterenol after chronic pre-treatment with 0, 25, 50, or 100mg/kg of metformin twice daily for 14 days. Isoproterenol (100mg/kg) was injected subcutaneously on the 13th and 14th days to induce acute myocardial infarction.

Results: Isoproterenol alone decreased left ventricular systolic pressure and myocardial contractility indexed as LVdp/dtmax and LVdp/dtmin. The left ventricular dysfunction was significantly lower in the groups treated with 25 and 50mg/kg of metformin. Metformin markedly lowered isoproterenol-induced elevation in the levels of TLR4 mRNA, myeloid differentiation protein 88 (MyD88), tumor necrosis factor-alpha (TNF- α), and interleukin 6 (IL-6) in the heart tissues. Similar changes were also seen in the serum levels of TNF- α and IL-6. However, the lower doses of 25 and 50mg/kg were more effective than 100mg/kg. Phosphorylated AMPK α (p-AMPK) in the myocardium was significantly elevated by 25mg/kg of metformin, slightly by 50mg/kg, but not by 100mg/kg.

Conclusion: Chronic pre-treatment with metformin reduces post-myocardial infarction cardiac dysfunction and suppresses inflammatory responses, possibly through inhibition of TLR4 activities. This mechanism can be considered as a target to protect infarcted myocardium.

Keywords: Metformin, Toll like receptor, AMPK, myocardial infarction

Abstract No: 499

Human placental extract ameliorates amiodarone-induced lung structural changes in rats

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Abstract

Background: Amiodarone is used in treatment of cardiac arrhythmias. Therapeutic use of amiodarone is limited by its side effects, including pulmonary toxicity. Human Placenta Extract (HPE) contains a variety of bioactive substances.

Materials & Methods: Thus, the present study aimed to quantitatively evaluate the protective effects of HPE on the structural lung changes induced by amiodarone using stereological methods. Sprague Dawley male rats were divided into four groups. The first, second, and third groups received no treatment, amiodarone (100 mg/kg/ i.p.), and HPE (500µl/kg/i.p.), respectively. On the other hand, the forth group was treated with amiodarone+HPE. The lungs were removed after 10 days. The lung volume was estimated using the Cavalieri principle on the embedded and cut tissue and corrected for shrinkage. The volume density of the parenchyma, alveolar space, and septa were estimated using point counting method. The surface area of the alveoli, the volume weighted means alveoli volume, and mean septum thickness were also estimated.

Results: The total volume and thickness of the alveolar septum were increased by 40% and 28%, respectively. However, the total volume of the alveolar space was decreased by 31% in the amiodarone treated rats. The mean alveolar volume was decreased by 64% on the average in the amiodarone treated group. Yet, these changes were not detected in the amiodarone + HPE group. Moreover, RBC accumulation in the alveolar space and septa was ameliorated after HPE treatment.

Conclusion: It can be concluded that HPE can protect the lung tissue from the structural changes induced by amiodarone.

Keywords: Human Placenta extract; Lung; Amiodarone; Stereology

Abstract No: 239

The Interrupted Glycolysis Pathway does not maintain γ -Tocopherol Induced Cytotoxicity in the HT-29 Colorectal Cancer Cell Line

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Abstract

Background: Due to abnormalities in mitochondria in cancer cells, the cells use the aerobic glycolysis pathway to supply their ATP. Therefore, the inhibition of this pathway makes cancer cells more prone to therapeutic agents.

Materials & Methods: γ -Tocopherol elevates Reactive Oxygen Species production and apoptosis by inhibiting the mitochondrial electron transfer chain. In addition to inhibiting the aerobic glycolysis and prominent ATP depletion, 3-bromopyruvate also activates the cell death pathways, including apoptosis, in the cancer cells through the mitochondrial respiration interruption. Therefore, with regard to the importance of combination therapy in the treatment of cancer, it seems that a simultaneous use of the two combined can enhance the effect of γ -Tocopherol in eliminating the cancer cells through apoptosis.

Results: Our results showed that these compounds have no impact on healthy cells. It seems that γ -Tocopherol, because of its antioxidant properties, reduces the oxidative stress caused by the 3-bromopyruvate and inhibits the ROS production. As a result, it may reduce the Caspase-independent apoptosis as well as necrosis initiated by the ATP depletion and ROS production. However, in the case of simultaneous use of the two substances, the mitochondrial membrane potential collapsed and the Caspase-dependent apoptosis increased significantly compared to the γ -Tocopherol alone. Regarding the very important role of the ROS in the induction of cellular death and destroying cancer cells.

Conclusion: our results showed that compounds with therapeutic or preventive potential in cancer that have antioxidant activity as well should be used more carefully.

Keywords: γ -Tocopherol, 3-bromopyruvate, apoptosis, ROS, Hexokinase II, Mitochondria, Necrosis

Abstract No: 232

The cellular mechanism of toxicity induced by *Hemiscorpius lepturus* scorpion venom

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Abstract

Background: To investigate the mechanism mediating the toxic effects of the venom from *Hemiscorpius lepturus* scorpion on human colorectal carcinoma cell line (HT29).

Materials & Methods: The cytotoxic IC₅₀ concentration of the venom on HT29 cells was determined by MTT assay. This allocated concentration was employed for assessment of changes on generation of reactive oxygen species (ROS) by DCFH-DA and percent apoptosis and necrosis were measured by annexin V/PI double staining. (Determine by flow cytometry), and for measurement of mitochondrial potential ($\Delta\Psi_m$) DiOC6 was used. A total of 10,000 cells were used in triplicates from each sample

Results: The venom exerted a potent cytotoxic effect on HT29 cells with IC₅₀ concentration of 50 μ g/ml. Exposure of HT29 cells to the venom increased the generation of ROS with a collapse of the mitochondrial membrane potential in the cells. In addition, induction of both apoptosis and necrosis in HT29 cells was evident.

Conclusion: These data indicate the venom from *H. lepturus* scorpion induces its cytotoxic by apoptosis and necrosis in HT29 cells, and mitochondria dysfunction and ROS over production might play important roles in the process of cell injury and death.

Keywords: *Hemiscorpius lepturus* scorpion, HT29 cell line, venom, MTT, ROS, apoptosis, necrosis

Abstract No: 229

Development of a Reversed-Phase HPLC Method for Simultaneous Determination of Malondialdehyde and Anti-Oxidants Uric Acid, Retinol and α -Tocophrol

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Abstract

Background: Malondialdehyde, uric acid, retinol and α -tocophrol are four important parameters for the measurement of oxidative stress in biological systems. Malondialdehyde is one of the well-known secondary products of lipid peroxidation and may be used as a biomarker of oxidative stress. On the other hand, uric acid, retinol and α -tocophrol as non-enzymatic antioxidant defense system of the body protect biological systems from oxidative damages.

Materials & Methods: In the current study, an ion-pairing reversed-phase HPLC method on a C8 column with a DAD UV-detection was developed and validated for concurrent determination of malondialdehyde and anti-oxidants uric acid, retinol and α -tocophrol.

Result: The optimized column temperature was found at 30 °C and optimized wavelengths were found at 265 nm, 290 nm and 327 nm. The optimized eluent consisted of A: water and B: acetonitrile both containing 5 mM tetrabutylammonium salt and C: water-acetonitrile (2:98 % v/v). The elution mode was composed of steps of isocratic and gradient in order to ensure the elution of both hydrophilic and lipophilic analytes. The method was established to be linear in the ranges 1-50 μ g/mL for α -tocopherol, 2-50 μ g/mL for retinol, 0.5–20 μ g/mL for malondialdehyde, and 0.5-20 μ g/mL for uric acid. The limit of detection (LOD) and limit of determination (LOQ) was respectively measured at 1.1 and 1.7 μ g/mL for α -tocopherol, 0.3 and 0.5 μ g/mL for retinol, 0.3 and 0.5 μ g/mL for malondialdehyde and 0.2 and 0.4 μ g/mL for uric acid. In addition, the method showed to have a good and acceptable repeatability and intermediate precision so that it could be used for the determination of the analytes in subjects with damages due to oxidative stress.

Keywords: HPLC, malondialdehyde, uric acid, retinol, α -tocophrol

Abstract No: 275

Murine skin cancer prevention with natural products

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Abstract

Background: Botanical and nutritional products have been used for the prevention and treatment of cancer. Population studies suggest that a reduced risk of cancer is associated with high consumption of vegetables and fruits. Thus, the cancer chemo-preventive potential of naturally occurring products is of great interest.

Materials & Methods: In the present study we assayed the effect of tannic acid (TA), chorozophora tinctoria (Ch.t) and honey against benzoyl peroxide (BPO) mediated tumor promotion on mice skin carcinogenesis. Female Albino Swiss mice were given topical applications of TA, Ch.t extract, and honey for 15 days and after 24 hours, the skin of mice were initiated by single dose 7,12-Dimethylbenz(a)anthracene (DMBA) and promoted by multiple dose of benzoyl peroxide (BPO). The anticarcinogenic effects of TA, Ch.t and honey were evaluated. After 30 weeks on test, the number of benign papilomas per mouse were 0.15 ± 0.09 , 0.03 ± 0.05 and 1.81 ± 0.1 in TA, Ch.t and honey respectively as compared to 36 ± 1.41 in animals receiving BPO alone.

Result: Similarly, by week 50 the number of squamous cell carcinoma per mouse were 0.17 ± 0.1 , 0.00 ± 0.00 and 0.48 ± 0.7 respectively in the TA, Ch.t and honey pretreated group of animals as compared to 0.72 ± 0.36 in animals receiving BPO alone.

Conclusion: From these data we suggest that the antioxidants effects of tannic acid, chorozophora tinctoria can abrogate the tumor-promoting effects of BPO in mice skin and that chorozophora tinctoria is substantially more effective than tannic acid and honey.

Keyword: Tannic acid, Chorozophora tinctoria, honey, Dimethylbenz (a) anthracene. Benzoyl peroxide, skin carcinogenesis

Abstract No: 263

A disposition kinetic study of tramadol in intoxicated rats induced by ethanol in perfused rat liver model

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Abstract

Background: Tramadol is a synthetic analgesic with opioid structure which has a weak effect on opioid receptors in CNS. As the drug has a high morbidity, evaluating of drug complications is essential, especially in drug abusers.

Ethanol causes clinical and morphological changes such as fatty liver, liver inflammation, fibrosis, and cirrhosis and lipid peroxidation in many organs. In this study, the rate of tramadol metabolites in rats with damaged liver induced by ethanol was studied in a recirculation perfusion system.

Materials & methods: After determining the proper dose of ethanol, the rats were divided into two groups: control group (saline) and the recipient of ethanol. Animals received ethanol daily for 6 weeks. At the end of the sixth week, serum of liver enzymes (ALT, AST, ALP) along with histopathological examinations were performed. After confirming liver damage, tramadol pharmacokinetics was evaluated in a rotating system of hepatic perfusion and analyte concentrations were determined with HPLC. Tramadol added to perfusion with concentration 500ng/ml. Samples were collected during 180 minutes and analyte concentrations were determined by HPLC. Fluorescence detector used in this method, and samples were detected using a C18 column or ODS.

Results: Ethanol caused a significant increase in liver enzyme levels compared to the control group. Histopathological studies also confirmed liver injury by ethanol. Ethanol-injured liver reduces the metabolism of tramadol with subsequent decreases in its main metabolites.

Conclusion: It is find that liver damaged induced by ethanol caused a decrease metabolism of tramadol and levels its metabolites.

Keywords: Tramadol, ethanol toxicity, liver damage, lipid peroxidation, hepatic perfusion, HPLC

Abstract No: 440

Pirfenidone inhibit the lung fibrosis induced by paraquat herbicide: Involvement of oxidative stress suppression

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Abstract

Background: Paraquat (PQ) is widely used herbicides in Iran. Pulmonary fibrosis (PF) is the fatal toxicity of PQ with a high mortality as 55%. Although different treatment modalities have been implemented for pulmonary fibrosis induced by PQ poisoning, the results are not satisfactory. Pirfenidone (5-methyl-1-phenyl-2-[1H]-pyridone, PF) is a new anti-fibrotic agent approved for the treatment of Idiopathic Pulmonary Fibrosis in humans for patients with mild to moderate disease. In this research it is assumed that PF has beneficial effects on lung fibrosis and the objective of this study is to explore the effects of PF in the mice.

Methods & Materials: Lung fibrosis induced by intraperitoneally injection of a single dose of PQ (20 mg/kg) in male albino mice. Animals received PF (100 and 200 mg/kg, p.o.), N-Acetyl Cysteine (NAC, 200 mg/kg as positive control) and water (10 ml/kg as negative control, p.o.) since day 10 after PQ injection for 11 days. At day 21, the lungs were removed and the severity of fibrosis determined using histopathology and the level of hydroxyproline. Stress oxidative parameters including lipid peroxidation, catalase and superoxide dismutase (SOD) activity.

Results: Pirfenidone could dose-dependently decreased the severity of lung fibrosis in histopathological examinations. Pirfenidone decreased hydroxyproline and MDA contents. And SOD activities were increased in lung tissue when compared to the control group.

Conclusion: Our results show that PF inhibit PQ-induced lung fibrosis in mice through inhibition of oxidative stress. More molecular and clinical studies are recommended to demonstrate the mechanism (s) involved.

Keywords: Paraquat; Pulmonary fibrosis; Pirfenidone; Stress oxidative, Hydroxyproline

Abstract No: 426

Evaluation of inhibitory effect of melatonin on gastric adenocarcinoma AGS and MKN49 cell lines

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Abstract

Background: Melatonin is a neurohormone with important physiologic and pharmacologic role in human body especially in circadian rhythm. In recent years, some progress has been achieved to show its role in regulating in prevention of cancer especially breast and colon cancer. According to this background and as there was not any precise cellular research about the role of melatonin in gastric cancer in which this study this study has been aimed.

Methods & Materials: In this study, we used MTT assay procedure. Also, we have provided AGS and MKN-45 cell line from national cell bank, Institute Pasteur of Iran. The cells were cultured in RPMI medium in 5% CO₂, 37°C in 96 wells culture plate and then were incubated with melatonin and cisplatin (as positive control) for 48 hr. in 5 different concentrations. The proliferation index as cell viability was achieved and compared with controls groups with ELISA concerning Formazan crystal color absorbance between 450-690 nm.

Results: Our results showed that melatonin in 12.5-200 µM has significant anti-proliferative effects in AGS cells and in 50-200 µM in MKN-45 compared with control and these results were in parallel with the effects of cisplatin.

Keywords: Melatonin, gastric adenocarcinoma, Proliferation, MTT assay, Cisplatin

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Abstract No: 344

Prebiotic Raftilose attenuated the Aspirin-, Lipopolysaccharide- and Mycophenolate Mofetil-induced cytotoxicity in Caco-2 cells

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Abstract

Background: Our last in vivo studies indicated that Mycophenolate Mofetil (MMF)-induced gastrointestinal disorders resemble to those produced during long time aspirin administration rather than lipopolysaccharide-induced damages. To compare and to minimize the other interfering factors, the present study aimed to highlight cytotoxic effects of these three compounds on the Caco-2 cells as a model of the intestinal epithelium. Moreover, possible cytoprotective effects of prebiotic Raftilose on aforementioned compounds induced cytotoxicity were evaluated.

Materials & Method: Cell viability, cell produced level of nitric oxide and lipid peroxidation potency of compounds were measured by using tetrazolium salt reduction, Greise reaction and the produced malondialdehyde concentration, respectively.

Result: Results revealed that all three examined compounds and in a concentration-dependent fashion resulted in cytotoxicity against Caco-2 cells. Although our cell viability test indicated that MMF resulted in a potent cytotoxicity, however other two endpoints revealed that LPS exposure resulted in high NO and MDA production. The highest lipid peroxidation rate was obtained at 10 μ g/ml LPS exposed cells. Co-exposure of the cells against raftilose and cytotoxic compounds for 24 h revealed its cytoprotective property at low and medium used concentrations.

Conclusion: Our data suggest that all three compounds with some differences exert cytotoxic effects against Caco-2 cells, which may be protected by concurrent raftilose administration.

Keywords: Cytotoxicity; Caco-2 ; Lipid Peroxidation; Prebiotics

Abstract No: 339

Silymarin reduces bleomycin-induced lung injury through suppression of oxidative damage and inflammation

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Abstract

Background: The long-term clinical usefulness of bleomycin, an antineoplastic drug, is limited by bleomycin-induced lung toxicity. Bleomycin-lung injury, which is mediated by reactive oxygen species (ROS), eventually leads to pulmonary fibrosis. In addition to oxidative stress, inflammation is also evident in bleomycin pulmonary damage. Silymarin is a mixture of flavonolignans derived from the herb milk thistle (*Silybum marianum*) which has antioxidative and anti-inflammatory properties. In this study, we evaluated the effect of silymarin which has been identified as an antioxidant and anti-inflammatory compound on oxidative and inflammatory parameters in the lungs of mice exposed to bleomycin.

Materials & Methods: BALB/c mice were randomly divided into four groups of control (intratracheal saline), bleomycin (intratracheal bleomycin), bleomycin plus silymarin (50 and 100 mg/kg b.w). After bleomycin administration, mice received 10 days intraperitoneal (IP) silymarin treatment. On the 10th day blood and lung samples were collected and processed for measurement of oxidative and inflammatory factors.

Results: Bleomycin exposure caused an increase in lung lipid peroxidation (~92%). The activity of antioxidant enzyme such as glutathione-S-transferase (GST) and catalase (CAT) as well as pulmonary glutathione (GSH) was significantly decreased due to bleomycin treatment ($p < 0.05$). Lung Myeloperoxidase (MPO) activity was also increased significantly as the result of bleomycin injection (~70%). Furthermore, bleomycin administration leads to an increase in serum Tumor Necrosis Factor- α (TNF- α) (~60%) and Interleukin-6 (IL-6). Our findings revealed that silymarin treatment significantly reversed these biochemical and inflammatory factors.

Conclusions: Silymarin as a natural antioxidant attenuated bleomycin induced-pulmonary toxicity and this protective effect may be due to the ability of silymarin in keeping oxidant-antioxidant balance and regulating of inflammatory mediator release.

Keywords: bleomycin-Silymarin -antioxidants-inflammation -pulmonary damage

Abstract No: 244

Protective mechanisms of alpha-lipoic acid in apoptosis against hydrogen peroxide induced toxicity in human lymphocytes

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Abstract

Background: The naturally antioxidant and coenzyme, alpha-lipoic acid (α -LA), has gained considerable attention regarding different functions and therapeutically effective in treating oxidative stress associated diseases in the human body. This study was designed to examine the protective effect of α -LA against H₂O₂-induced oxidative stress and apoptosis in human lymphoid cells.

Materials & Methods: Human peripheral blood were obtained from healthy and non-smoker volunteers. Lymphocytes were isolated by Ficoll method and were preincubated with α -LA and then exposed to H₂O₂. After that, the viability of the cells by MTT assay, rate of apoptosis by flow cytometry and fluorescent staining, and also activities of caspase-3 and -9, were studied.

Results: Pretreatment of lymphocytes with α -LA, dramatically enhanced viability of the cells and decreased apoptosis. Investigation of caspases gives a clear picture of the mechanism by which α -LA increases viability and causes reduction in apoptosis by decreasing caspase-9-dependent mitochondrial pathway activities.

Conclusion: Collectively, our data, which correlate well with the other studies, show that α -LA is an ideal antioxidant compound which has profound effects on oxidation and apoptosis. So, it may indicate a new way towards the development of antioxidant therapy.

Keywords: Alpha-lipoic acid, Human lymphoid cells, H₂O₂, Oxidative stress, Apoptosis

Abstract No: 316

Atorvastatin attenuated the Paraquat-induced myeloperoxidase activity and enhanced the antioxidant capacity

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Abstract

Background: Macrophages are important cells in entire body defense and they have crucial role in the various infectious and /or non-infectious inflammations. Our previous study confirmed that CD68+ macrophages participated in the paraquat-induced inflammation and fibrosis. Therefore, in this study we aimed highlight the freshly isolated alveolar macrophages (AM) reaction to paraquat and also any protective effect of Atorvastatin.

Materials & Methods: The freshly isolated rat's AMs, following viability determination by using the trypan blue exclusion assay, were exposed to various concentrations of paraquat in the presence and absence of atorvastatin for 24 h. different endpoints including Tetrazolium salt induction assay, myeloperoxidase activity measurement through tetramethyl benzidine and 0.1 mM H₂O₂ reaction and also ferric reducing determination were performed. We found that 75 ± 5% of isolated cells were alive.

Result: Atorvastatin at 10 mg/ml concentration was able to protect the paraquat-induced cytotoxicity which was demonstrated with MTT assay. Moreover, atorvastatin also remarkably reduced the paraquat-elevated myeloperoxidase activity, while enhanced the ferric reducing power.

Conclusion: Our results suggest that, firstly freshly isolated AM could be a novel cytological tool to study other agents and protectants and secondly, atorvastatin protective effects on paraquat-induced cytotoxicity may partly attribute to its anti-myeloperoxidase and antioxidant properties.

Keywords: Alveolar Macrophages; Atorvastatin; Cytotoxicity; Paraquat

Abstract No: 300

Evluation of MT2 receptor expression in adenocarcinoma patients

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Abstract

Background: Gastric cancer accounts 8 % of the total cancer cases and 10 % of total cancer deaths worldwide. The indoleamine N-acetyl-5-methoxytryptamine, better known as melatonin, is the principal hormone produced by the pineal gland. Recently, it has shown some anticancer role in some malignancies such as breast and colon cancer; also, some of its protective roles in the GI tract are as free radical scavenger and as antimitogenic and apoptotic agents. Based on the anticancer effects of melatonin and wide distribution of this neurohormone in the GI tract and some proposed physiologic and pharmacologic roles for this neurohormone, this study is initially scheduled to determine the expression of melatonin receptor MT2 in tissue samples of adenocarcinoma cancer patients.

Materials & Methods: For this aim, a total of 30 gastric adenocarcinoma patients and 30 normal individuals were selected and examined for MT2 gene expression by real-time PCR.

Results Our results have shown interestingly high expression for MT2 receptor in cancer and marginal cancer tissues compared with normal people.

Conclusions: According to our results, it is concluded that for the first time, the expression of MT2 receptor in gastric adenocarcinoma tissues which was in parallel with breast and colon cancer studies and high expression of this receptor in the marginal tissues indicate refractory mechanism which shows the defending role of melatonin in the GI system. Our experiments has not shown any relationship between MT2 receptor expression and grade and clinicopathological features of gastric tumor, so we cannot conclude any relationship between this receptor expression and progression of the tumor, although this expression can be considered as an etiology.

Keywords: Melatonin. Gastric adenocarcinoma .MT2 receptor. Gene expression

Abstract No: 285

Inhibition of stress oxidative is involved in the anti-fibrotic effect Glycyrrhiza glabra on paraquat-induced lung fibrosis

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Abstract

Background: Usage of antioxidants is considered as one of the strategy to cure lung fibrosis in paraquat poisoning. Lung fibrosis is the major adverse effect of PQ poisoning that causes high mortality and morbidity in exposed subjects. There is evidence that Glycyrrhiza Glabra (GG) and its main constituent thymoquinon are potent antioxidant. So the objective of this study was to explore the effects of Glycyrrhiza Glabra methanolic extract, as treatment and prophylaxis, on the lung fibrosis and oxidative stress parameters in the mice model of PQ lung fibrosis. Activation of ERK MAPKs by GG in lung fibrosis was also studied.

Material & Methods: A mice model of paraquat (PQ)-induced lung fibrosis. Experiments performed in two ways: in treatment setting, animals received GG extract (500 and 1000 mg/kg, i.p.) at day 10th after PQ injection. In pretreatment setting, animals received GG extract concomitant with PQ (Day 0) for 21 days. In each setting, the positive group received N-Acetyl Cysteine (NAC, 200 mg/kg) and normal saline as negative control (extract solvent, 10ml/kg). At day 21, the lungs were removed and the severity of fibrosis determined using histopathology and the level of hydroxyproline. Stress oxidative parameters including lipid peroxidation, catalase and superoxide dismutase (SOD) activity.

Results: Methanolic extract of GG could dose-dependently decrease the severity of lung fibrosis in histopathological examinations. Treatment with GG decreased hydroxyproline and MDA contents in comparison to the control group. Meanwhile, NS treatment significantly increased the reduced levels of SOD by PQ. Moreover, the protective effects of GG extract was higher when it was administered as pretreatment. Activation of ERK1/2 protein was consistent with the antifibrotic effects of GG in histopathology examination.

Conclusion: Results show that Glycyrrhiza glabra methanolic extract might be used to treat and prevent PQ-induced lung fibrosis. More molecular studies are recommended to demonstrate the mechanism (s) involved.

Keywords: pulmonary fibrosis; Paraquat; Glycyrrhiza glabra methanolic extract; stress oxidative parameter, hydroxyproline, ERK1/2 MAPK

Cellular & Molecular Toxicology II

Abstract No: 468

Captopril Inhibited Methamphetamine-Induced Mitochondrial Damage in Heart Isolated Mitochondria

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Abstract

Background: Methamphetamine (METH) using showed cardiotoxicity via oxidative stress and mitochondrial damage. Captopril, an angiotensin-converting enzyme inhibitor, is known for its antioxidant properties.

Materials & Methods: In this study we used Captopril for attenuating of METH-induced mitochondrial damage in heart isolated mitochondria. Mitochondrial fraction was isolated male rats and treated as follows: control, METH and Captopril and METH plus captopril. After 1 h incubation, oxidative stress markers (reactive oxygen species (ROS), lipid peroxidation, glutathione and protein carbonyl) and mitochondrial damage (MTT) were measured.

Results: Captopril significantly decreased the level of lipid peroxidation and protein carbonyl in METH group by inhibition of ROS formation. Captopril also significantly increased the levels of mitochondrial glutathione (GSH). Mitochondrial function decreased dramatically after METH administration that Captopril pre-treatment significantly improved mitochondrial function.

Conclusion: These results suggested that Captopril prevented METH-induced oxidative stress and mitochondrial dysfunction in heart isolated mitochondria. Therefore, the effectiveness of this antioxidant should be evaluated for the treatment of METH cardiotoxicity.

Keywords: Captopril, Methamphetamine, Mitochondria, cardiotoxicity, Oxidative stress

Funding: This study was supported by Mazandaran university of Medical Sciences.

Abstract No: 481

Malathion affects on mitochondrial bioenergetic of liver

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Abstract

Background: Malathion is an organophosphate (Ops) pesticide used in agriculture and domestic for several years. Ops can change mitochondrial respiration and respiratory chain enzyme activity, energy production, cell death, and dynamic, whereas mechanisms of metabolic disorders of Malathion has not been clarified. The aim of the present study is analyze of the hepatotoxic effect of Malathion which caused biochemical and ultrastructural mitochondrial changes in adult male Wistar rats.

Materials & Methods: To assess Protein concentration of tissue and mitochondrial samples we used bicinchoninic acid method. The rate of nicotinamide adenine dinucleotide (NADH) reaction, cytochrome C oxidase activity, ATP synthase activity, glycogen and lactate was measured by spectrophotometer. Succinate-ubiquinone oxidoreductase activity was measured by measurement of the reduction rate of 2, 6-dichlorophenolindophenol (DCPIP). Malathion (400 mg/kg in corn oil) were given to rats (n=6) orally via gavage and then the mitochondrial respiratory chain function, the lactate and glycogen content were investigated at the end of the 24 hour comparatively with control group (n=6). All values are expressed as mean± SEM. Student's t-test was used to assess differences of group means. P<0.05 was taken to be statistically significant.

Results: A significance reduction was observed in the activity of NADH-ubiquinone oxidoreductase and cytochrome C oxidase with no change in succinate-ubiquinone oxidoreductase and ATP synthase. Reduction in the glycogen content and elevation of lactate content were seen in this study maybe is in association with impairment of cellular respiration.

Conclusion: The maintenance of mitochondrial integrity by elimination of oxidative stress induced by mitochondria, prevention of cellular ATP reduction by electron donors and exogenous ATP can be the therapeutic strategies in Ops poisoning.

Keywords: organophosphate; Malathion; liver; mitochondrial respiratory chain enzymes

Abstract No: 539

Effect of thymoquinone on D-galactose-induced model of aging in mice

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Abstract

Background: Aging is a gradual biological phenomenon which is illustrated with different morphological and biochemical changes in biological system. Inductions of oxidative stress, elevation of serum proinflammatory cytokines and reduction of sex hormones level have been considered as some biochemical changes during aging. Thymoquinone (TQ), the main constituent of the volatile oil from *Nigella sativa* seeds is reported to possess strong antioxidant property. Therefore, the aim of this study was to investigate the anti-aging effect of TQ in mice.

Materials & Methods: For induction of aging, D-galactose (500 mg/kg) was administrated to mice (subcutaneously) for 42 days. Animals were treated with D-galactose alone or with TQ (2.5, 5 and 10 mg/kg, intraperitoneally). At the end of treatment, malondialdehyde (MDA) as a marker of lipid peroxidation and glutathione (GSH) content was measured in liver and brain tissues. Also, enzymes including aspartate aminotransferase (AST) and alanine aminotransferase (ALT), TNF- α and IL-6 as proinflammatory cytokines and male sex hormones were measured in serum.

Results: Administration of D-galactose induced aging phenomena which characterized with induction of oxidative stress in brain and liver. Proinflammatory cytokines, ALT and AST markedly elevated while Level of male sex hormones significantly decreased in serum. Interestingly, treatment with TQ (2.5, 5 and 10 mg/kg) decreased lipid peroxidation with parallel enhancement of GSH content. Reduction of serum TNF- α and IL-6 and elevation of male sex hormones were observed following treatment with TQ.

Conclusion: TQ exhibited anti-aging effect in this model. These effects in part can be due to antioxidant activity of TQ.

Keyword: D-galactose, Thymoquinone, Aging, Oxidative stress

Abstract No: 498

Reversible effect of single dose administration of scopolamine on memory impairment, oxidative stress and acetylcholinesterase activity in hippocampus

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Abstract

Background: Extensive research has established that the central cholinergic system is involved in the storage and retrieval of information during new learning. Based upon this ‘cholinergic hypothesis’, one model is provided by the use of scopolamine. Scopolamine is a non-selective post-synaptic muscarinic receptor antagonist that blocks the stimulation of post-synaptic receptors and causes memory deficits when administered to young healthy subjects. Therefore, rats with scopolamine-induced memory deficits were used as an animal model for screening antidementia drugs. Recently, it has been reported that memory impairment induced by scopolamine in rats is associated with altered brain oxidative stress status, however, there is no evidence about the stability of memory impairment induced by single dose administration of scopolamine. The main purpose of this study was investigating the stability of scopolamine-induced oxidative stress following single dose by passive avoidance method (shuttle box). In this method, memory impairment was evaluated due to decreased step through latency time comparing to control group.

Materials & Methods: Male albino Wistar rats (200 ± 20 g) were divided randomly into five groups for each course: control group (healthy samples), sham (saline) and 3 experimental groups 0.7, 1 and 3 mg/kg scopolamine. 24 hours after training section, different doses of scopolamine were administered intraperitoneally for and memory retention was evaluated 30 minutes after administration or 7 days after that. Hippocampi were dissected from brain tissues for assessing biochemical parameters, acetylcholinesterase activity and lipid peroxidation.

Results: Behavioral results indicated that after 30 min, scopolamine impaired memory retention in all experimental groups dose-dependently. Also, acetylcholinesterase activity and lipid peroxidation, increased after this period.

Conclusion: However, all these effects of scopolamine reversed after 7 days, indicating that deleterious effect of single dose scopolamine can be abolished through the time.

Keywords: scopolamine, single doses, memory, lipid peroxidation, acetylcholinesterase

Abstract No: 135

Beta lactam structured Cox-2 inhibitors: Novel anti-cancer candidates with selective toxicity on Mitochondria isolated from Acute Lymphocytic Leukemia (ALL) B lymphocytes

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Abstract

Background: Beta lactam structured Cox-2 inhibitors possess anti-proliferative and anti-inflammatory effects. In this research the effects of Beta lactam structured Cox-2 inhibitors on cell viability of B- cells obtained from children diagnosed with acute lymphocytic leukemia (ALL) were investigated.

Methods & Materials: Beta lactam derivatives inhibited the proliferation of B lymphocytes by inducing apoptosis in a concentration and time dependent manner. We isolated mitochondria from both cancerous B- lymphocytes and also Normal lymphocytes and investigated parameters of mitochondrial damage following administration of Beta lactam derivatives. Treatment with Beta lactam derivatives caused a rapid loss of mitochondrial transmembrane potential, rise of reactive oxygen species (ROS) formation, release of mitochondrial cytochrome c into cytosol, and subsequent caspases cascade in cancerous BUT NOT normal mitochondria and lymphocytes.

Results: Pre-treatment with antioxidants such as BHT and pore sealing agents like CsA significantly inhibited Beta lactam induced cytochrome c release in the cancerous lymphocytic mitochondria. Our results suggest that Beta lactam induced ROS production leads to mitochondria MPT pore opening and subsequent death signaling that resulted in apoptosis in cancerous lymphocyt.

Conclusion: The induction of apoptosis by beta lactam compounds may provide a pivotal mechanism for its anti-cancer candidacy in acute lymphocytic leukemia patinas.

Keyword: Cox-2 inhibitors, Mitochondria, Apoptosis, Beta lactam, Acute Lymphocytic leukemia

Abstract No: 133

Effects of α -gliadin administration on gene expression profile of chemokines in central nervous system in mice

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Abstract

Background: Gluten is the most widely used food to trigger development of multiple autoimmune diseases and neurological disorders. Recently, an association between anti-gliadin serum antibodies and CNS autoimmune diseases such as MS has been reported. Concerning the involvement of chemokines synthesized in activated astrocytes and microglial cells in cellular infiltration and brain defense mechanisms, the present study was conducted to investigate chemokines gene expression in CNS of mice immunized with gliadin.

Materials & Methods: Healthy female 6-8 weeks old C57BL/6 mice were assigned into 3 groups (N=6). Mice in group 1 were injected subcutaneously (sc) with PBS (400 μ l). In group 2, mice were immunized sc with complete freund adjuvant (CFA; 400 μ l). In group 3, mice were immunized sc with peptic-tryptic-gliadin (300 μ g) emulsified in CFA (400 μ l). Boosters containing the same amount of antigen were injected on days 7 and 14. On day 28, mice were sacrificed and brain and spinal cord tissue were removed. RT-PCR was used to evaluate the mRNA expression of MCP-1, CXCL2, and CXCL10 chemokines.

Results: mRNA expression for MCP-1 and CXCL2 were increased significantly ($p < 0.05$) in group 3 in comparison to control groups (group 1 and 2). Conversely, the level of CXCL10 expression in group 3 in comparison to group 1 and 2 was significantly ($p < 0.05$) up-regulated and down-regulated respectively.

Conclusion: The changes in gene expression profile of chemokines may be involved in α -gliadin-induced

Keyword: α -gliadin, Chemokine, MCP-1, CXCL2, CXCL10, CNS

Abstract No: 122

Toxicity mechanisms of cigarette smoke on Mouse Fetus Mitochondria

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Abstract

Background: Maternal smoking has been recognized as a common cause of low birth weight, preterm birth, decrease of gestational age period. Unfortunately, there is increasing interest of public specially woman in Iran in the tobacco products consumption. On the other hand, the deleterious effect of maternal smoking on human fetus in pregnancy period especially in the first trimester encouraged us to investigate toxicity mechanisms of cigarette smoke on mouse fetus mitochondria.

Materials & Methods: For this purpose we used cigarette smoke extract (CSE) on pregnant NMRI mice, three groups (control, sham and test) of animals were chosen and different concentrations of standardized cigarette smoke extract (1, 10 and 100%) were administrated.

Results: Our results showed significant increase at ROS formation, lipid peroxidation, mitochondrial membrane potential collapse, mitochondrial swelling and finally decrease in ATP concentration in the CSE-treated isolated fetus mitochondria.

Conclusion: Our results suggest that CSE-induced embryo toxicity is the result of disruptive effect on mitochondrial respiratory chain that leads to ROS formation, lipid peroxidation, mitochondrial MMP decline and decrease of ATP level which starts apoptosis signaling

Keywords: Cigarette smoke extracts (CSE); Embryo toxicity; Mouse fetus; isolated mitochondria

Abstract No: 238

The role of α - synuclein protein in Aluminium -induced cell dead in PC12 cells.

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Abstract

Background: Aluminum (Al) is a neurotoxic metal that contributes in the pathogenesis of Parkinson disease (PD). A-synuclein (α -syn) is a cytoplasmic protein that has been implicated in the development of PD. The aim of this study was to investigate the role α -syn protein in Al-induced toxicity in the PC12 cell.

Materials & Method: Specific α -syn small interference RNA (siRNA) was used to knocking down the expression of α -syn protein in the PC12 cell. The effects of different concentration of Al-maltolate were then evaluated on cell viability and markers of oxidative stress in the α -syn downregulated cells.

Result: The results showed that Almal dose dependently induced apoptosis and increased malondialdehyde (MDA) and catalase activity in control PC12 cells. Downregulation of α -syn protein significantly increased cell viability and decreased oxidative markers in Almal treatment cells.

Conclusion: These findings suggested that α -syn protein was involved in Al-induced apoptosis and oxidative stress in the PC12 cells

Keywords: Alpha synuclein, Aluminum maltolate, oxidative stress, apoptosis

Abstract No: 152

Antioxidant and anti-inflammatory effects of phloretin in an experimental sepsis model in rats.

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Abstract

Background: Sepsis is the debilitating systemic disease and described as a severe and irregular systemic inflammatory reaction syndrome (SIRS) against infection. As phloretin is a natural antioxidant agent, we employed a CLP (cecal ligation and puncture) model in rats to investigate an anti-inflammatory and antioxidant effects of phloretin as well as determining its protective effect on liver tissue damage caused by sepsis.

Materials & Methods: The rats were randomly divided into three groups (n=7) as follows: sham group, sepsis group (CLP) and CLP + phloretin group. Sepsis was induced by cecal ligation and puncture (CLP) method. Phloretin was administered intraperitoneally in two equal doses immediately after surgery and at the post-operative 12th hour.

Results: It was observed that serum BUN and TNF- α level were dramatically increased in CLP operated group when compared to sham group. Moreover, there were no significant differences in serum creatinine and creatinine phosphokinase level between groups.

Conclusion: Our finding suggested the strong antioxidant and anti-inflammatory effects of phloretin against the tissue damage likely by free oxygen and nitrogen radicals in an experimental sepsis created model.

Keywords: Phloretin, Sepsis, CLP, TNF- α , Oxidative Stress, Antioxidants.

This study was supported by a grant from the Research Council of Tehran University of Medical Sciences, Tehran, Iran.

Abstract No: 146

Effect of crude Venom of *Odonthobuthus doriae* scorpion on ion channels in cell culture

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Abstract

Background: Scorpion venom toxicity is one of the major medical concerns from old years, due to its influence on human activities and health. From many years ago a lot of researches established to examine different aspects of venom toxicity and its effects on different organs. During these years researchers are doing more specific studies on the cytotoxicity of scorpion venom. In Iran, *Odonthobuthus doriae*, the yellow scorpion is one of the major threats based on its neuro toxicity and severe pathophysilogic effects and researchers tried to find the mechanism of these neuro toxic effects. The previous studies have shown that in isolated organs the yellow scorpion venom is affecting the ion channels. Also some studies showed that this venom has severe cytotoxic effects in the cell lines with more ion channels like nerve cell lines.

Materials & Methods: In this study the cytotoxic effect of the crude venom of *o.doriae* on the 1321N1 cell line and DRG primary cell cultured investigated in the presence of different ion channel blockers: Ouabain (1mmol as Na channel blocker), Nifedipin (100μmol as Ca channel blocker), TEA (40mmol as K channel blocker) by MTT method.

Result: The result showed that the *o.doriae* crude venom has cytotoxic effect via Na channels.

Keywords: Scorpion, *Odonthobuthus doriae*, 1321N1, Channel blocker.

Abstract No: 254

Methanolic Extract Of The Persian Gulf Sponge, *Axinella Sinoxea* Induces Cell Apoptosis Through Mitochondria In Human Chronic Lymphocytic Leukemia Cells.

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Abstract

Background: Sponges are important components of the Persian Gulf animal communities and marine sponges of the genus *Axinella sinoxea* is a genus of sponges in the family Axinellidae. Species of *Axinella sinoxea* occur in the Indian, Pacific Oceans and Persian Gulf. Chronic lymphocytic leukemia (CLL) is a disease characterized by the relentless accumulation of CD5+ B lymphocytes. CLL is the most common leukemia in adults, about 25–30% of all leukemias.

Materials & Methods : In this study B lymphocytes mitochondria (cancerous and non-cancerous) were obtained using differential centrifugation from peripheral blood subjects and mitochondrial reactive oxygen species (ROS) production, collapse of mitochondrial membrane potential (MMP) and mitochondrial swelling was examined by fluorescence spectrometer following the addition of *Axinella sinoxea*.

Results: Our in vitro results with ONLY cancerous BUT NOT normal non-cancerous group mitochondria revealed significant ($P < 0.05$) increase in mitochondrial ROS formation, MMP collapse, and mitochondrial swelling and cytochrome c release after addition of different concentrations of *Axinella sinoxea*.

Conclusion: These results showed that *Axinella sinoxea* total methanolic extract has a selective toxicity on chronic lymphocytic leukemia mitochondria and hence may be helpful in the treatment of CLL.

Keywords: Sponge, *Axinella sinoxea*, Mitochondria, Chronic Lymphocytic Leukemia.

Abstract No: 192

New Triazene compound effects on 4T1 cell line and induced breast cancer.

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Abstract

Background: Breast cancer is second leading cause of cancer deaths in women. The lifetime probability of developing breast cancer is about 13% in women. Triazene compounds have many applications in various fields such as anticancer drugs.

Materials & Methods: In this study we want to find out anti-cancerous effects of 1-(3,5-Dichlorophenyl)-3-(2-ethoxyphenyl) triaz-1-ene compound on 4T1 cell line and induced breast cancer in mice. For in vitro research, 4T1 cells were treated with different concentrations of 1-(3,5-Dichlorophenyl)-3-(2-ethoxyphenyl) triaz-1-ene. Cell viability was assessed by MTT assay. For tumor induction 4T1 cells were injected subcutaneously into Balb/c mice. When tumor observed, mice were randomly assigned to groups and were treated with Triazene compound. Tumor sizes in each group were compared before and after treatment. Caspase8 gene expression was analyzed by RT-PCR. MTT assay results shows that IC₅₀ for 1-(3,5-Dichlorophenyl)-3-(2-ethoxyphenyl) triaz-1-ene on 4T1 cells in 24h was 30μMol.

Results: Analysis of tumor size shows a significant reduction at triazene treated groups compared with control group. RT-PCR result shows increase in Caspase8 gene expression at triazene treated groups compared with control group. 1-(3,5-Dichlorophenyl)-3-(2-ethoxyphenyl) triaz-1-ene reduce 4T1 cell viability in vitro and also reduce tumor size in vivo. It could induce apoptosis in tumors by increase in Caspase8 gene expression.

Keyword: Breast cancer, Caspase8, 1-(3,5-Dichlorophenyl)-3-(2-ethoxyphenyl) triaz-1-ene, 4T1

Abstract No: 507

Comparison cytotoxicity of Velcade in melanoma and colorectal cancer cell lines

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Abstract

Background: Bortezomib (also known as PS-341 or Velcade) used for the treatment of multiple myeloma, is being studied for the treatment of several other cancers. The drug is a highly selective inhibitor of the 26S proteasome.

Materials & Methods: We evaluated the effect of bortezomib on to Melanoma cell line in vitro using a 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay. Here we investigated the antiproliferative effect of Velcade on C26 colon cancer and B16F0 melanoma.

Results: The IC₅₀ concentrations for B16F0 and C26 were 15 nM and 29 nM, respectively, indicating that B16F0 cells are more sensitiveto proteasomal inhibition.

Conclusion: It was determined that B16F0 cells proliferate more rapidly than C26 cells.

Keywords: Velcade, cytotoxicity, melanoma cell line, colorectal cancer cell line, MTT assay

Abstract No: 319

Neobaicalein, a flavonoid isolated from *Scutellaria litwinowii* Bornm. & Sint. Ex Bornm targets mitochondrial apoptotic pathways in leukemic cell lines

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Abstract

Background: Summary Neobaicalein is a flavonoid that is found in the roots of *Scutellaria litwinowii* Bornm. & Sint. Ex Bornm. In the current study, the apoptotic effects of neobaicalein on two myeloid cell lines, apoptosis-proficient HL60 cells and apoptosis-resistant K562 cells, were analyzed.

Materials & Method: Neobaicalein could reduce the cell viability in a dose-dependent manner according to the MTS assay and the values of IC₅₀ against HL60 and K562 cells were 40.5 μ M and 84.86 μ M respectively after treatment for 48 h.

Results: The apoptosis induction by neobaicalein in HL60 and K562 cells was verified by PI staining, and degradation of PARP (poly-ADP-ribose polymerase) was found in K562 cells. Next, activation of the caspase cascade for both the extrinsic and intrinsic pathways including caspases-8, -9 and -3 was demonstrated. We also found that the expression of Bax protein increased which lead to an increase of the Bax/Bcl-2 ratio in both cell lines. To sum up, neobaicalein caused cytotoxicity and induced apoptosis in HL60 and K562 cells through interaction with the mitochondrial membrane proteins involved in apoptosis.

Conclusion: Neobaicalein was demonstrated to induce apoptosis in both myelogenous leukemia cells and merits further investigation regarding therapeutic options in treatment of hematological malignancies.

Keywords: apoptosis, Bax, caspase, Fas receptor, *Scutellaria litwinowii*, poly (ADP ribose) polymerase, neobaicalein

Abstract No: 283

Time course study of scopolamine-induced memory impairment, oxidative stress and acetylcholinesterase activity in hippocampus following repeated doses

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Abstract

Background: Cholinergic systems are involved in learning and memory. Scopolamine, a muscarinic cholinergic receptor antagonist, has been widely adopted to study cognitive deficits in experimental animals. Also, it has been reported that memory impairment induced by scopolamine in experimental animals is associated with increased oxidative stress and acetylcholinesterase enzyme activity in the brain especially in the hippocampus, which is involved in memory formation. Therefore, scopolamine-induced memory deficits were used as an experimental animal model for screening anti-dementia medicines. Most studies have been used single administration of scopolamine which induce reversible memory impairment but there is no evidence about the memory impairment, stability of it and also biochemical changes in the hippocampus following repeated doses scopolamine administration which is the main purpose of this study.

Materials & Methods: Male sprague-dawley rats (200 ± 20 g) were divided randomly into five groups: control (without any treatment), sham (saline injected) and scopolamine groups (0.7, 1 and 3 mg/kg). The memory assessment was performed by passive avoidance test. The animals trained at first day and 24 hours after, daily received scopolamine intraperitoneally for 7 consecutive days. Retention test performed 30 min and 7 days after the last injection of scopolamine. The hippocampus were dissected from brain tissues for assessing biochemical parameters includes acetylcholinesterase activity and lipid peroxidation immediately after behavior test.

Result: Behavioral results indicated that memory retention was dose-dependently impaired in all experimental groups. Also, acetylcholinestrerase activity and lipid peroxidation, increased irreversibly over the time. Injection of 3 mg/kg scopolamine had the most deleterious effect on memory retention and biochemical parameters in both time.

Conclusion: Our results indicate that scopolamine in repeated doses administration produce irreversible memory retention deficit and brain biochemical changes persists for one week after the last administration.

Keywords: scopolamine, repeated doses, memory, lipid peroxidation, acetylcholinestrerase

Abstract No: 262

The effect of Acetaminophen intoxication on Tramadol pharmacokinetics in rat, a perfusion study

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Abstract

Background: Tramadol is a synthetic analog of codeine and morphine with centrally acting opioid analgesic. Its widespread use throughout the world leading to misuse of Tramadol. The most important side effects of tramadol are drowsiness, constipation, dizziness, nausea, orthostatic hypotension, seizures and respiratory depression. Changes in the metabolism of this drug can increase side effects. Acetaminophen is the most widely used over-the-counter analgesic and antipyretic drugs. Acetaminophen overdose and chronic use can cause serious liver damage. The purpose of this study was to evaluate changes in the metabolism of tramadol in the liver damage caused by acetaminophen.

Materials & Methods: After determining the appropriate dose of acetaminophen. Rats were divided into two groups of six, the control group (saline) and the recipient of acetaminophen. Animals received acetaminophen daily for 5 weeks. At the end of the five week serum of liver enzymes (ALT, AST, ALP) were measured and Histopathological examination was performed on the liver. After observation of liver damage, Tramadol drug metabolism in the liver recirculation perfusion system was studied. Tramadol was added to the perfusion solution and in 180-min samples were collected and the concentrations of tramadol and its major metabolites were determined by HPLC.

Results: Liver enzyme levels were significantly higher in liver damage group with confirmed liver damage by histopathological examination. There were also significant reductions in tramadol metabolites in liver damaged compared to control group.

Conclusion: It is find that liver damaged induced by acetaminophen caused a decrease of tramadol and its metabolites.

Keywords: Tramadol, acetaminophen toxicity, liver damage, NAPQI, liver perfusion, HPLC

Abstract No: 571

Effect of quetiapine on attenuation of morphine-induced conditioned place preference: Evaluation of CREB, p-CREB, ERK and p-ERK proteins level in rat hippocampus

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Abstract

Background: Several neuroanatomical systems are involved in morphine dependence. The dopaminergic mesolimbic system which consists of ventral tegmental area (VTA), nucleus accumbens, and medial prefrontal cortex is mentioned as crucial pathways in the rewarding actions of opiates. Roles of different proteins such as cAMP-response element binding protein (CREB) and extracellular signal-regulated kinase (ERK) have been considered in morphine induced conditioned place preference (CPP). Therefore the purpose of current study was evaluation the effect of quetiapine on attenuation of morphine-induced CPP in rat followed by determination the level of CREB, p-CREB, ERK and p-ERK proteins in hippocampus using western blot analysis.

Method & Materials: Different doses of quetiapine (10, 20, 40 mg/kg) were co-administrated whit morphine (10 mg/kg) for 4 days in conditioned phase. On day 8, the effects of morphine preference was compared to normal saline as negative control. Then level of CREB, p-CREB, ERK and p-ERK proteins in hippocampus were evaluated using western blot analysis.

Results: Quetiapine (10 mg/kg) didn't block morphine preference while quetiapine (20, 40 mg/kg) significantly reduced time spends in morphine house on day 8. Administration of morphine (10 mg/kg) didn't change level of CREB, p-CREB and ERK protein levels in hippocampus while p-ERK level markedly elevated in morphine group. Treatment of animals with quetiapine (10, 20 and 40 mg/kg) significantly reduced level of this protein ($P < 0.001$ vs morphine).

Conclusion: The results indicated that administration of quetiapine (20, 40 mg/kg), significantly reduced morphine-induced CPP in rats. In regard to important role of dopaminergic and serotonergic pathways in morphine CPP, and because of the antagonist effect of quetiapine on serotonin and dopamine receptors, it seems that, these pathways may be important for the effect of quetiapine in this model. Also, effect of quetiapine on p-ERK proteins level in hippocampus can be considered as cellular mechanism.

Keywords: Morphine, Quetiapine, Conditioned place preference, CREB, p-CREB, ERK, p-ERK

Abstract No: 545

Comparison of Breast and Ovarian Cancer Cells Reaction to Serum Starvation

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Abstract

Background: Cancer is still one of the leading causes of mortality worldwide and looking for more effective treatments is still a big aim in chemotherapy. Thus beyond synthesizing new anticancer agents, better understanding about cancer biology can provide a better view on developing newer chemotherapeutics. The cells at the center of a tumor bear metabolic stress and suboptimal growth conditions. Following chemotherapy and tumor shrinkage they face favorable growth conditions again, which may lead to tumor recurrence. In this project, the reaction of human breast and ovarian cell lines, MCF-7 and A2780, in harsh metabolic stress conditions was studied.

Materials & Methods: In this regards, the cells in culture plates were exposed to different serum concentrations (10%, 0.5%, 0.25% and 0%) for up to 6 days. At 24-hour intervals, cell morphology (inverted light microscopy), cell cycle and size (flow cytometry), mitochondrial content (MTT assay) and protein content (SRB assay) were analyzed. In addition, in each day, the cells were released in media containing 10% serum and the cells were analyzed with the above-mentioned tests.

Results: The results of this study showed that serum starvation could cause a delayed G1-S transition and re-stimulation with serum could facilitate this transition. However, MCF-7 cells were more successfully arrested in G1 phase. Furthermore, sub-G1 population of the cells does not increase dramatically along with starvation in neither of the cell lines. Increased cell proliferation is observed, accompanied by decreased cell size in MCF-7, while A2780 showed a decreased cell proliferation, which could not be released. The mitochondrial function of MCF-7 cells did not change dramatically while an obvious decrease in such function was observed in A2780 cells, both of which could be released. Protein content of MCF-7 cells also had an increasing pattern while A2780 cells showed a decreasing pattern of intercellular protein content. In both cell lines protein content could be released. **Conclusion:** These results along with the evidences of low cell death in the form of apoptosis or autophagy, confirmed that MCF-7 is a relatively resistant cell line to harsh metabolic stress, and even after a long period of 6-day starvation, re-exposing the cells to optimal environmental conditions can facilitate their reentry to normal cell life again, while the ovarian cell line showed obvious different characteristics.

Keywords: MCF-7, A2780, Serum Starvation, Release

Abstract No: 87

The antioxidant activity of palmitoleic acid on oxidative stress indices in palmitic acid induced lipotoxicity in adult rat cardiomyocyte

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Abstract

Background: In spite of decrease of cellular TAC values in palmitic acid treated groups compare to control groups by 24% at 24h interval, the palmitoleic acid groups have shown 45% and 19% increase in cellular TAC values compare to control groups over 24 and 48 hour time points, respectively. Also, palmitic acid+ palmitoleic acid treated groups have shown 44% and 11% increase in cellular TAC values in comparison with control groups after 24h and 48h incubation, respectively.

Materials & Methods: TAC values measured in media in palmitic acid groups have shown 25% and 22% decrease compare to control groups over 24 and 48 hour time points, while this values in palmitoleic acid treated groups have increased by 18% and 2% in comparison with corresponding control over 24 and 48 hour time points, respectively.

Results: Meanwhile, palmitic acid+ palmitoleic acid treated groups have shown 26% and 2% increase in TAC values measured in media in comparison with control groups over 24 and 48 hour time points. MDA values measured in cell have shown significant decrease by 14% and 5% in palmitoleic acid treated groups compare to the control groups over all the time points, but MDA values measured in media in palmitoleic acid treated groups compare to control groups After 24h and 48h incubation have shown 20% and 47% increase, respectively. Furthermore MDA values measured in media and cell have shown significant increase in palmitic acid treated groups compare to control groups which increased by 193% and 147% respectively over 24h time point and 103% and 99% respectively, over 48h time point, and MDA concentration measured in media and cell in palmitic acid+ palmitoleic acid treated groups have shown 132% and 179% increase and 29% and 125% increase compare to control groups, respectively at 24h and 48h interval. While MDA concentrations measured in media and cell in palmitoleic acid groups compare to

corresponding control increased by 20% and 47% after 24h incubation and decreased by 14% and 5% after 24h and 48h incubation, respectively.

Conclusion: It can be concluded that Palmitoleic acid can be considered as a dietary supplement to diminish harmful effects of oxidative stress in palmitic acid induced lipotoxic cardiomyocyte. Although, its efficacy based on the best doses and effective interval usage needs more investigates in future.

Keywords: Palmitoleic acid, Palmitic acid, lipotoxicity, oxidative stress

Abstract No: 102

Selective Toxicity of Persian Gulf Sea Cucumber Species (*Holothuria Parva*) Extract on Liver Mitochondria Isolated from Animal Model of Hepatocellular Carcinoma

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Abstract

Background: Natural products isolated from marine environment are well known for their pharmaco-dynamic potential in diversity of disease treatments such as cancer or inflammatory conditions. Sea cucumbers are one of the marine animals of the phylum Echinoderm and the class Holothuroidea, with a leathery skin and gelatinous body. Many studies have shown that the sea cucumber contains antioxidants and anti-cancer compounds.

Materials & Methods: To induce hepatocarcinogenesis, rats were given DEN injections (i.p., 200 mg/kg, by single dose), and then cancer promoted by 2-acetylaminofluorene (2-AAF) (0.02 w/w) for two week. Histopathological evaluations and levels of liver injury markers and liver cancer specific marker, alpha-fetoprotein (AFP), were also determined for confirmation of hepatocellular carcinoma induction. Finally mitochondria isolated from cancerous and non- cancerous hepatocytes.

Results: Our results showed that *H.parva* methanolic increased reactive oxygen species (ROS) formation, mitochondrial membrane permeabilization (MMP), and mitochondrial swelling and cytochrome c release only in cancerous BUT NOT non- cancerous liver hepatocytes mitochondria.

Conclusion: Results suggest that *H. parva* may be a promising therapeutic candidate for the treatment of HCC patients.

Keywords: Sea cucumber, *Holothuriaparva*, Mitochondria, Hepatocellular carcinoma.

Abstract No: 107

Selective Toxicity of apigenin on Mitochondria obtained from Hepatocellular Carcinoma Hepatocytes

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Abstract

Background: Apigenin (APG), a flavone subclass of flavonoids, has been shown to have a strong anti-cancer effect on various cancer models via the programmed cell death, apoptosis. Liver cancer, especially hepatocellular carcinoma (HCC), is the fifth most common cancer and the third foremost cause of cancer associated death globally.

Materials & Methods: In this investigation HCC was induced by a single intraperitoneal injection of diethylnitrosamine (DEN) in corn oil at 200mg/kg body weight to rats. Two weeks after DEN administration, cancer development was promoted with dietary 2-acetylaminofluorene (2-AAF) (0.02%, w/w) for 2 weeks. Histopathological evaluations and levels of liver injury markers and liver cancer specific marker, alpha-fetoprotein (AFP), were also determined for confirmation of hepatocellular carcinoma induction. Then rat liver hepatocytes were isolated with collagen perfusion technique and cancerous hepatocytes were sorted by flow cytometry. Finally mitochondria isolated from cancerous and non- cancerous hepatocytes were tested for any probable toxic effect of APG.

Results: Our results showed that APG (10, 20 and 40 μ M) increased reactive oxygen species (ROS) formation, mitochondrial membrane permeabilization (MMP), and mitochondrial swelling and cytochrome c release only in cancerous BUT NOT non- cancerous hepatocyte. Apoptotic effect of apigenin on HCC cells was evaluated by annexin V-FITC/PI double staining analysis.

Conclusion: These results suggest the eligibility of the flavonoid APG as a complementary therapeutic agent for patients with hepatocellular carcinoma.

Keywords: Apigenin, Apoptosis, Mitochondria, Hepatocellular carcinoma

Abstract No: 223

Evaluation the effect of *Quercus infectoria* and *Terminalia chebula* hydroalcoholic extract on melanin producing in cell line B16/F10 melanoma

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Abstract

Background: Pigmentation has become an important phenotypical characteristic, in the pharmaceutical, medicinal as well as in the cosmetic field. Plants and their extracts are inexpensive and rich resources of active compounds that can be utilized to inhibit tyrosinase activity as well as melanin production. Natural and synthetic chemical agents can frequently modulate the metabolism of pigmentation produced. Dose dependent effect of hydroalcohol extract of *Terminalia chebula* (Tc) and *Quercus infectoria* (Qi) were studied at different concentrations. Concentrations of these two extracts were chosen based on this preliminary screening for impact of Tc, Qi and Kojic acid (as standard reference) on melanogenesis and tyrosinase activity. Inhibitory effect of Tc and Qi on melanogenesis and tyrosinase activity were investigated in B16/F10 melanoma cells by spectrophotometric method. Extracts of Tc and Qi showed 67.24% and 63.11% inhibition of melanogenesis and 54.46% and 57.96% inhibition of DOPA to DOPA-chrome conversion at 475 nm respectively.

Keywords: B16/F10 melanoma, *Quercus infectoria*, *Terminalia chebula*, tyrosinase activity, melanin content

Abstract No: 221

An in vitro study of antioxidant effect of melatonin, Co-enzyme Q10 and vinpocetine in improvement of TNF- α and acetylcholinesterase levels in human lymphocytes exposure to chlorpyrifos

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Abstract

Background: Chlorpyrifos (CP) as an organophosphorus pesticide is generally considered to induce neurotoxic and immunotoxic effects. It inhibits neuronal acetylcholinesterase and also induces abnormality in tumor necrosis factor- α (TNF- α) mRNA expression which leads to increase of this proinflammatory cytokine.

Materials & Methods: Cytotoxicity of CP, in the presence or absence of effective doses of melatonin, Co-enzyme Q10 (CoQ10), and vinpocetine was determined in human peripheral blood lymphocytes after 3-day exposure. The levels of acetylcholinesterase (AChE) activity along with TNF- α , as inflammatory index, were measured.

Results: Our results demonstrated a remarkable decrease in TNF- α levels and improvement of acetylcholinesterase activity in the groups treated with CoQ10 and combination of three antioxidants.

Conclusion: CP toxicity overwhelms the intracellular antioxidant defense mechanisms. Exogenous supplementation with antioxidants, such as the ones we have investigated, seems to be effective in prevention of cytotoxicity

Acknowledgment: This study was partially supported by TUMS and INSF

Keywords: Human lymphocytes, Organophosphorus, Chlorpyrifos, Melatonin, Co-enzyme Q10, Vinpocetine

Abstract No: 258

Toxicity mechanisms of noise on isolated mitochondria obtained from rat brain

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Abstract

Background: Hearing impairment is a rapidly growing healthcare issue worldwide, which has a profound impact on an individual's quality of life. Noise exposure is one of the major causes of sensorineural hearing loss, such as noise-induced hearing loss (NIHL), which is one of the most common occupational diseases in both developed and developing countries. Approximately 5% of the world's population suffers from hearing loss due to exposure to high levels of noise.

Materials & Methods: Hence, a significant effort has been made to understand the pathophysiological mechanisms of noise-induced cell death in the cochlea as well as to develop interventions in order to reduce or prevent NIHL. Exposure to noise was performed in a sound chamber and then Rat mitochondria were obtained by differential ultracentrifugation and incubated primary cause of intense mitochondrial oxidative phosphorylation and resultant reactive oxygen species (ROS) overproduction, overwhelming endogenous antioxidant defenses.

Results: The overproduction of ROS could also trigger reactive nitrogen species (RNS) formation in the mitochondria. The overproduced ROS and RNS after exposure to high levels of noise have been known to be the major contributors to NIHL. and so, lipid peroxidation and mitochondrial membrane potential collapse before mitochondrial swelling ensued in isolated brain mitochondria. Disturbance in oxidative phosphorylation was also confirmed by decrease in ATP concentration in the noise rat treated mitochondria. In addition, collapse of mitochondrial membrane potential (MMP) and mitochondrial swelling caused release of cytochrome c via outer membrane rupture or MPT pore opening.

Conclusion: Our results suggested that noise -induced toxicity in brain tissue is the result of disruptive effect on mitochondrial respiratory peroxidation, mitochondrial membrane potential decline and cytochrome c expulsion which starts apoptosis signaling and cell loss.

Keywords: Noise; isolated mitochondria; mitochondrial dysfunction; Cytochrome c release

Abstract No: 448

Cytotoxicity of gallic acid (GA) on normal cell line

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Abstract

Background: The continuing problems caused by malignant disease and the failure of conventional chemotherapy to cure advanced invasive carcinoma indicates that new approaches to control the disease are critically needed. The ability of polyphenol to protect cells from 'oxidative stress' has been demonstrated. In addition, these compounds show a wide and contradictory spectrum of action, such as antitumor. GA is a polyhydroxyphenolic compound which can be found in various natural products. Initially, GA was reported as a free radical scavenger and as an inducer of differentiation and apoptosis in leukemia, lung cancer, and colon adenocarcinoma cell lines, as well as in normal lymphocyte cells. It has been postulated that GA plays an important role in the prevention of malignant transformation and cancer development. In this study, the relation of the intracellular uptake of GA with Normal Human Fibroblast cell line was investigated. The toxic effect of the GA was investigated by MTT test.

Results: GA showed no toxicity effect in different ranges of concentration (0 to 100 µg/mL) on Normal Human fibroblast cell line.

Keywords: gallic acid, Cytotoxicity, cell line

Abstract No: 441

Effect of Gallic acid on mitochondria isolated from the rat liver

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Abstract

Background: Gallic acid is one of the phenolic acid compounds that are abundant in green tea and food supplements. It has antioxidant activity and antiproliferative effect on cancer cells [1]. In vivo, study shows that Gallic acid cause liver injury and increase of aminotransferase level. In vitro, study shows LD50 of Gallic acid on hepatocytes 3mM [2]. On the other hand, mitochondria is the most important organelle in the apoptoses pathway. We focused on the effect of Gallic acid on isolated liver mitochondria.

Methods & Materials: Mitochondria was extracted from Sprague-Dawley rat's liver using differential centrifugation then its viability was measured by MTT test. This test is a quantitative colorimetric method to determine cell viability. It utilizes the yellow tetrazolium salt (MTT) which is metabolized by mitochondrial dehydrogenase enzyme from viable cells to yield a purple formazan reaction product which was determined spectrophotometrically at wavelength of 570nm[3]. Isolated mitochondria incubated with different concentrations of Gallic acid (/005-5mM) for one hour. Then the supernatant was removed and MTT was added for two hours.

Results: Absorbance increased in the dose-dependent manner. In the other words, by increasing concentration, formazan insoluble was increased. Increasing in absorbance from concentration 0/3, 1 and 5 mM to compare control group was significant. (p<0/05)

Keywords: Galli acid, mitochondrial viability, isolation mitochondria, mitochondrial toxicity,

Abstract No: 404

A disposition kinetic study of tramadol in Bile duct ligated rats in perfused rat liver model

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Abstract

Background: Tramadol hydrochloride is a synthetic opioid analgesic drug with central acting and use for severe acute or chronic pain. In liver, tramadol was metabolism by cytochrome P450 isoenzymes. O-desmethyltramadol (M1) is the main metabolite of tramadol and has more than 200 times analgesic effect than tramadol. To investigate the effects of Bile Duct Ligation (BDL) on the pharmacokinetics of tramadol were used liver recirculating perfusion system in male rats.

Methods & Materials: Male rats were divided into six groups: control, sham and two weeks BDL and four weeks BDL. Serum levels of liver enzymes (AST, ALT) were measured before perfusion and the pharmacokinetics of tramadol was evaluated by using liver recirculating perfusion system. Tramadol and metabolites concentration were determined by HPLC-FL.

Results: The sharp increase in liver enzymes level in both BDL groups was seen and significant changes were observed in liver weight and volume. Tramadol metabolites concentration significantly decreased compared with the control and sham group.

Conclusion: Due to The decrease in the hepatic metabolism of tramadol and increase half-life of elimination of Tramadol in cirrhotic liver, in cirrhotic patients dosage adjustments for tramadol are required to prevent the toxic side effects of tramadol.

Keywords: Tramadol, BDL, Liver Damage, Liver Perfusion, HPLC-FL

Abstract No: 438

Effect of hydroalcoholic extract of saffron (*Crocus sativus*) on the on the treatment experimental autoimmune diabetes in C57bl/6 mice

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Abstract

Background: Streptozotocin (STZ) is a potent alkylating toxin and damages islet β cells. When STZ is given in multiple low doses, it elicit T-cell-dependent immune responses, and induce autoimmune diabetes in a manner similar to human type I diabetes. This study was done to investigate effect of hydroalcoholic extract of saffron (*Crocus sativus*) on the clinical aspects of experimental autoimmune diabetes in C57bl/6 mice.

Methods & Materials: After stabilization of diabetes, mice were orally treated with hydroalcoholic extract of saffron (500 mg/ Kg) for 3 constitutive weeks. Treatment with saffron significantly diminished hyperglycemia.

Results: Moreover, saffron treatment decreased the lymphocytes proliferation and nitric oxide production in splenocyte population of mice. Histopathological observations indicated that STZ-mediated destruction of β cells was ameliorated by saffron treatment.

Conclusion: It seems that hydroalcoholic extract saffron may have a therapeutic effect against destruction of β cells and insulinitis in the animal model of type 1 diabetes.

Keywords: Saffron, Multiple-low-dose-streptozotocin, Type 1 diabetes

Abstract No: 355

Allopurinol down-regulated the hypoxia-induced factor-1 \square expression in neuro-2a cells exposed to hypoxia/reoxygenation

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Abstract

Background: The hypoxia and reoxygenation (H/R) cause cellular and molecular damages in all organs and in particular in neuronal tissues. The current study aimed to examine the neuroprotective effect of Allopurinol on hypoxic, hypoxic/reoxygenated neuro-2a cells.

Materials & Method: A 30 minutes exposure of the cells to hypoxic medium, which was provided by the combination of 5 mM 2-deoxy glucose and 5 \square M antamycine A resulted in ATP depletion, while considerable number of the cells remained alive.

Results: Allopurinol prevented from cell death and ATP depletion in a concentration-dependent manner. The hypoxic non-treated neuro-2a cells exhibited some morphological differences in comparison to control cells such as loosing confluence, the spindle shape and branching, which the allopurinol-treatment not completely but relatively and concentration-dependently protected from morphological alterations. Allopurinol (63.5 \square M) regulated the hypoxia-up regulated expression of hypoxia inducible factor-1 \square (HIF-1 \square).

Conclusion: Our data suggest that Allopurinol improved the hypoxia/reoxygenation induced morphological damages and ATP depletion, which may be mediated via regulation of the HIF-1 \square expression.

Keywords: Allopurinol; Hypo

Abstract No: 345

Folate-decorated carboxymethyl cellulose for controlled doxorubicin delivery

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Abstract

Background: Doxorubicin (DOX) is a very efficient antitumor drug, has been adopted in the therapy of a wide variety of cancers, but its administration is limited by a dose-dependent, reversible, and progressive cardiomyopathy. Its limitation of toxoids is their systemic toxicity, which causes severe adverse side effects. This toxicity has restricted dosage, which often leads to incomplete tumor eradication. To overcome these limitations various polymeric systems synthesized for pharmaceutical applications. The main functions of polymeric carriers are to sustain release of drug or transport drugs to the site of action or both of them. By loading of drugs in polymer network by various technic the drugs are protected from interacting with other molecules to avoid its potential toxic effects on the cells.

Materials & Methods: So in this study, we synthesized polymer network based on nontoxic polysaccharide, carboxymethyl cellulose, as the drug carrier. The vitamin folic acid (FA), was covalently linked to the main chain of the polymer network to produce a targeted drug carrier and reduced the toxicities of cells. The loading of DOX was carried out on prepared polymer network and in vitro drug release behavior was investigated.

Keyword: Doxorubicin, Toxicity, Polymer network, Folic acid, Sustain release

This study was financially supported by Urmia University and the corresponding author has been authorized to submit it.

Abstract No: 342

Morphine modulates oxidative stress markers and antioxidant status in male rat brain

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Abstract

Background: In the current study, biochemical modifies with long term application of morphine in rat's brain were assessed.

Materials & Methods: Twenty male Wistar rats (200–240 g) were involved and separated into two groups. Normal saline was given intraperitoneally in the control group (n = 10). Morphine group (n = 10) received morphine intraperitoneally at a dose of 5, 10, 15 mg/kg/day in the first, second and the third ten days of the study, respectively. Serum levels of alanine amino-transferase (ALT), aspartate aminotransferase (AST), lactate dehydrogenase (LDH) and brain malondialdehyde (MDA) activity as well as levels of catalase (CAT), glutathione-s-transfrase (GST), superoxide dismutase (SOD) and Reduced glutathione (GSH) were studied.

Result: Serum levels of AST, ALT and LDH were significantly increased in the rats received morphine versus the rats received vehicle. The evaluation of MDA in brain showed that the MDA level was significantly upper in the morphine treated rats versus to the control rats ($P < 0.05$). The activities of CAT, GST, SOD and GSH were dramatically lesser in the morphine treated rats versus to the control rats. ($P < 0.05$).

Conclusion: Our investigation exhibited the risk of brain damage through the long term application of morphine by disturbance oxidant-antioxidant balance. While morphine is pointed to be effective in pain management, their toxic effects should be kept in mind during the chronic application.

Keywords: morphine, oxidative stress, brain damage, antioxidant

Clinical Toxicology

Abstract No: 36

Determination of Golden Time for Saving an Aluminum Phosphide-Poisoned Victim

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Abstract

Background: Aluminum phosphide (AIP) is a widely used fumigant pesticide which generates highly toxic phosphine gas in contact with water and moisture. Many researches were done and many antidotes were theoretically or experimentally proposed for AIP poisoning treatment but fundamental researches regarding AIP chemistry are needed to reveal the golden time for saving an AIP poisoned victim.

Methods & Materials: In the present work volume of released gas from minimum lethal amounts of AIP tablet was measured in conditions similar to those which occur in the stomach. Volume of released gas was measured in distilled water (DW) and acidified DW separately. PH changes of the mixtures were also measured and continuously monitored.

Results: Results showed that every therapeutic measure .should be done during a golden time of 20 min post ingestion of AIP tablet.

Keywords: Aluminum phosphide, phosphine, golden time

Abstract No: 29

Creatine phosphokinase (CPK) ratio (CPK day2/CPKday1) and not absolute CPK is a valuable predictor of duration of admission in poisoned patients.

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Abstract

Background: poisoned patients are in risk of increased creatine phosphokinase (CPK) enzyme due to many situations for example: long time loss of consciousness, seizure, drug induced rhabdomyolysis and trauma. This study was carried out to investigate prognostic effect of elevated CPK in poisoned patients.

Methods & Materials: All records of admitted poisoned patients in medical toxicology centre who had CPK more than 500 mg/dl were studied from March 2011 to March 2012. A checklist consist of 57 items were fulfilled for 430 patients. Duration of admission, need to mechanical ventilation and need to ICU admission were considered as outcome markers. Data were analyzed by SPSS 11.5 software and results were discussed.

Result: CPK of day1 and also CPK of day2 are not significantly correlated with duration of admission, need to ventilator, need to ICU admission although CPK ratio (CPK day2/CPKday1) is significantly related to duration of admission as a predictive factor.

Conclusion: We don't suggest absolute CPK as a predictor of outcome in poisoned patients; instead, CPK ratio (CPKday2/CPKday1) can be considered a reliable prognostic factor in poisoned patients.

Keywords: cpk, poisoning, prognosis

Abstract No: 496

Gasoline self-injection: a case report study

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Abstract

Background: Majority of intoxication or suicide behaviours reports of hydrocarbons are due to inhalation intravenous injection (1,2) or ingestion, but there is rare reports about subcutaneous injection of gasoline (3).

Methods & Materials: We intend report a 17 year-old boy who injected gasoline into his soft tissue for suicide attempt.

Results: He developed soft tissue necrosis of forearm necrosis .He underwent compartment syndrome, fasciotomy and debridement of necrotic tissues, at the operation room. The patient didn't developed multi organ failure. Management of gasoline intoxication depends on the base of exposure.

Keyword: Gasoline, subcutaneous injection,

Abstract No: 511

EPIDEMIOLOGICAL STUDY OF ALCOHOL POISONED PATIENT ADMITTED TO THE SINA HOSPITAL- TABRIZ DURING THE YEAR 1393

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Abstract

Background: Poisoning represents one of the most common medical emergencies and intoxication is still a major cause of morbidity and mortality. In this study we attempt to evaluate the epidemiology of alcohol poisoning.

Methods & Materials: This was a cross-sectional descriptive study, being performed in Tabriz Sina hospital -Tabriz University of Medical Sciences during the year 1393. The study included patients hospitalized due to acute alcohol poisoning. Demographic and Etiological factors were recorded and analyzed.

Results: During this period, 53 cases of alcohol poisoned were hospitalized in Sina hospital, in majority of 40 cases, poisoning was due to alcohol that including ethanol (50%), and methanol (50%) respectively. Only 13 cases were due to ethylene glycol and isopropyl alcohol etc. About 61% of cases were hospitalized between 4-96 hours. Most of the poisoning cases were intentional and the largest group of patients includes cases at age 29 to 35 years. Patients at age above 60 years formed the lowest group among the total number of poisonings. All the admitted cases were men. Also out of 53 cases, 40 cases of poisoning have occurred in cities and other 13 in rural areas.

Conclusion: The current study suggests that most of the poisoning cases involved among the middle age group particularly male. Ethanol and methanol contributed most of the poisoning cases which calls for urgent involvement of authorities for prevention programs and taking all the factors into consideration.

Keyword: Epidemiology, Ethanol, Methanol, Ethylene glycol, Piosoning

Abstract No: 125

Acute Poisoning in Adults Admitted in Ardabil Imam Khomeini Hospital

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Abstract

Background: Poisoning is one of the most common causes that referred to the Emergence and one of the most important Medicine immediacy. Correct and immediate diagnosis and accommodative treatment can be lifesaving. Knowing the overall pattern of poisoning in any geographical area would help to better manage and treat the victims.

Methods & Materials: In a cross sectional descriptive study, the required information was collected from the records of patients showing drugs and chemical poisoning who referred to Imam Khomeini hospital. Collected data was statistically analyzed using SPSS software.

Results: Out of 2852 case of poisoning, 106 people passed away due to severe complication. Of these 56.8% were men and 43.2% were women. The majority of cases (76.8%) were from urban areas. Suicide was the main cause of poisoning (66.53%). Accidental poisoning was recorded for 5.01% of cases. In 28.45% of cases, the cause of poisoning was not identified. The age group 21-30 years made the highest number of cases (52.3%). Tramadol, Benzodiazepines and Acetaminophen were the most poisons used respectively. Benzodiazepine was the most taken drug in suicide (19.97%).

Conclusion: Results showed that poisoning with Tramadol and Benzodiazepines is high in Ardabil Province. Opioids, Aluminum Phosphide and Organophosphorus are the main causative of death in poisoned victims in the province of Ardabil

Keywords: Toxicity, Suicide, Poisons, Tramadol

Abstract No: 148

N-Acetylcysteine, Ascorbic acid and Methylene Blue for the treatment of Aluminium phosphide poisoning: Still beneficial?

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Abstract

Background: Intentional and accidental intoxication with Aluminum phosphide (ALP) remains a clinical problem especially in the Middle East region. Considering the high mortality rate besides lack of any recommended first option drug for its treatment, this study was aimed to compare the therapeutic effects of N-Acetyl cysteine, vitamin C and Methylene blue, both in isolate and also in combination, for the treatment of ALP intoxication in a rat model.

Methods & Materials: In this experimental animal study 80 male Wistar rats in 8 groups were intoxicated with ALP (12.5 mg/kg) and treated with a single dose of NAC (100 mg/kg) or vitamin C (500-1000 mg/kg) or Methylene blue (1 mg/kg/ 5min (0.1%) or two of these agents or all three of them (Controls were not treated). Rats were monitored regarding parameters of drug efficacy as increased survival time and reduced morbidity and mortality rate for three consecutive days to ensure toxin neutralization. Macroscopic changes were recorded and biopsy sections were taken from brain, cerebellum, kidney, liver and heart for microscopic evaluation regarding cellular hypoxia.

Results: The mean survival times of rats exposed to ALP and treated with Vit C +NAC was 210.555 ± 236.22 . In analysis of survival times, there was a significant difference between Group 5 which received Vit C +NAC and the other groups ($p < 0.01$). Serum Magnesium levels after death were higher than normal ($p = 0.01$).

Conclusions: Despite the higher survival rate of antioxidants treated rats compared with controls, this difference was not statistically significant.

Keywords: Aluminum phosphide; Vitamin C; Methylene blue; N-Acetyl cysteine

Abstract No: 141

Evaluation of N-Acetyl Cysteine performance in acetaminophen poisoning using certain liver and renal factors in plasma

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Abstract

Background: Annually, acetaminophen poisoning causes probable acute liver and renal failures in different societies. N-acetyl cysteine (NAC), first suggested as an effective antidote to fight against acetaminophen poisoning in 1970, prevents the binding of NAPQI to hepatic cells.

Methods & Materials: In the present study 30 patients with the average age of 27 and acetaminophen poisoning who referred to the poisons unit of Sina hospital in Tabriz were selected as the study sample. During the 24 hours of hospitalization, the blood samples of the patients were taken and collected in heparinized tubes. The plasma was separated by centrifuge and kept in tubes in -70°C until it was analyzed by a high performance liquid chromatography method (HPLC) and laboratory analytical kits.

Results: the glutathione peroxidase (GPX) activity difference between the patients and control group was significant at first ($P < 0.05$) but this significant difference disappeared following the treatment. A significant difference was observed in urea level after 24 hours of treatment between the patients and control group ($P < 0.05$). However, at the beginning of the treatment and before administration of NAC, no significant difference was reported between the plasma levels of urea ($P > 0.05$).

Conclusion: The activity level of GPX changed before a tangible change in regular liver enzymes. Urea level increased after 24 hours of treatment despite serum therapy and hydration condition.

Keywords: N-Acetyl Cysteine, Acetaminophen, Urea, Alanine transaminase, Glutathion peroxidase

Abstract No: 161

Taurine attenuates chemotherapy induced hepatotoxicity in acute lymphoblastic leuk

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Abstract

Background: Taurine has multiple physiological activities and it is decreased by chemotherapy. The purpose of our study was to evaluate the Taurine has multiple physiological activities and it is decreased by chemotherapy. The purpose of our study was to evaluate the effect of oral taurine supplementation on the incidence of chemotherapy-induced hepatotoxicity in patients with acute lymphoblastic leukemia.

Methods & Materials: Forty young patients aged over 16 (ranges: 16-23 years) suffering from acute lymphoblastic leukemia (all receiving same chemotherapy regimen) were recruited for the study at the beginning of maintenance course of their chemotherapy. The study population was randomized in a double blind manner to receive either taurine or placebo (2 gram per day orally, divided in two doses, taken 6 hours after chemotherapeutic agents) for 6 months. Life quality and adverse drug reactions were assessed using questionnaire. Blood cell count, hemoglobin, hematocrit, serum bilirubin, transaminases, malondialdehyd and superoxide dismutase concentrations were evaluated. Data was analyzed using Statistical Package for Social Sciences (SPSS) software.

Of forty participants, 32 finished the study (14 female and 18 male; mean age 19.2±1.9 years).

Results: The results indicated that the levels of white blood cells were significantly ($P < 0.05$) increased in taurine treated group, but other hematological values did not differ significantly in either group. Taurine administration improved liver functions, indicated by decline of serum bilirubin and transaminases in comparison to the controls ($P < 0.05$). Moreover, taurine significantly reduced serum malondialdehyd and superoxide dismutase levels ($P < 0.05$).

Conclusion: This study showed that taurine co-administration decreased chemotherapy-induced hepatotoxicity during the maintenance therapy in acute lymphoblastic leukemia.

Keywords: acute lymphoblastic leukemia, taurine, chemotherapy-induced adverse effects, hepatotoxicity

Abstract No: 176

Clinical features and prognosis of paraquat poisoning: a review of 41 cases.

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Abstract

Background: Paraquat is a contact herbicide which is highly toxic to human. Deliberate self-poisoning with paraquat continues to be a major public health concern in many developing countries. This study aimed to evaluate the data on cases of acute paraquat poisoning and to compare different variables between survivors and non-survivors.

Materials & Methods: In this cross sectional study, medical records of all paraquat intoxicated patients were reviewed at Taleghani hospital of Urmia, Iran, from 2007 to 2013, retrospectively. Demographics, clinical features and laboratory findings were evaluated. The variables compared between survivors and non-survivors were the amount of paraquat ingested, occurrence of vomiting after ingestion, time and place of hospital admission, length of hospital stay, leukocytosis, serum creatinine level and the outcomes.

Results: A total of 41 patients were evaluated. The mean \pm standard deviations of patient's age were 31.6 ± 16.9 years. The Length of hospital stay was 5.75 ± 4.6 days. Most poisonings occurred in spring and summer. The in-hospital fatality rate was 46.3%. Statistically significant associations were found between the outcome of patients and the amount ingested ($p=0.001$), vomiting ($p=0.004$), early need to intensive cares ($p=0.009$), leukocytosis ($p=0.001$), serum creatinine levels ($p=0.001$), manifestations of acute hepatic ($p<0.001$) and respiratory failure ($p=0.007$).

Conclusion: Ingestion of more than 30 ml, prompt vomiting, early need to intensive cares, leukocytosis, and multi-organ failures are major determinants for fatal outcome of paraquat poisoning. It may be useful to educate health professionals and the general population about the serious consequences of exposure to paraquat.

Keywords: Paraquat Poisoning, Suicide, Deliberate Self-Harm, Fatal Outcome, Herbicides, Pesticides, Toxicology

Abstract No: 248

Recurrent seizures after lidocaine ingestion; a case report

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Abstract

Background: Lidocaine has a concentration-dependent effect on seizures. Concentrations above 15 µg/mL frequently result in seizures in laboratory animals and man. We report a case of central nervous system (CNS) lidocaine toxicity and recurrent seizure after erroneous ingestion of lidocaine solution.

Materials & Methods: A 4-year- old boy presented to the emergency department of Imam Hospital of Sari in December 2013 due to tonic-clonic generalized seizures approximately 30 minutes ago. 3 hours before seizure, his mother took him erroneous 2spoons (amount 20-25 cc) lidocaine hydrochloride 2% solution instead of pediatric gripe. Seizure with generalized tonic-clonic were 3 times in home. Neurologic examination was essentially unremarkable expect for the depressed level of consciousness. The personal and medical history was unremarkable. No evidence of intracranial ischemic or hemorrhagic lesions in CT scan. There were no further seizures, remained stable and the patient was discharged 2 days after admission.

Conclusion: The use of viscous lidocaine may result in cardiovascular and central nervous system toxicity, partionlarly in children.

Keywords: recurrent seizure, lidocaine ingestion

Abstract No: 213

Descriptive Analysis of Recorded Poisoning phone calls in Iran Drug and Poisoning Information Centers in 2013, Tehran-Iran

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Abstract

Background: Poisoning is one of the most important causes of morbidity and mortality in the world. Pattern of poisonings in each country has differences with the other regions. From this view, performing of dedicated epidemiological studies on poisoning in each country are necessary for planning of prevention programs. The purpose of this study was to determine pattern of poisoning reported to Drug and Poison Information Centers in Iran.

Materials & Method: A descriptive-retrospective study was carried out on poisoning-related calls received by the DPICs from March 2013 to March 2014. A standard forms have been designed for this purpose and then, the data were extracted from recorded queries. Data such as: Patient's demographics (age, gender), type of poisoning (unintentional, intentional), cause of poisoning were collected. Finally, the descriptive analysis was performed on the collected data.

Result: By evaluating total 270,000 inquiries in 2013, 38% of phone calls were males while females were 62%. About 2.3% of these cases were poisoned cases (6187 patients). The main cause of poisoning was medicines (60.3%), following by chemical agents (12.3%) and opioids abuse (addiction 10.8%), food poisoning (8.7%) and pesticide (4.1%). Poisoning by poisonous plants (1.4%) was the least cause in these 6187 poisoning cases. Intentional poisoning records (55%) were more than unintentional cases (45%).

Conclusion: In this study, the most frequent type of poisoning which reported to all Iran DPICs, was pharmaceutical-induced intentionally poisonings. Although this pattern is similar to the other countries, but unfortunately in 2014, poisoning calls because of deliberate ingestion of drugs for suicide purpose has been increased. So adequate supervision and safe packaging, storage and disposal of drugs and chemicals could be the most important activities for prevention of poisoning. Improvement in the public education for rational use of drugs and household chemical will help in reducing the incidence of poisoning.

Keyword: Drug and poison information centers, Poisoning

Abstract No: 81

Pulmonary disease induced by Mustard gas as chemical warfare: a study of veteran cadavers

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Abstract

Background: The most common chemical warfare agents used in the Iran-Iraq war from 1980-1988 was Mustard gas .To the best of our knowledge, the major long-term sequel of its exposure is lung disease, so in this current study we examined veteran cadavers lungs

Methods & Materials: All received 35 exposed cadavers by MS gas in the Iran-Iraq war autopsied and examined by lungs in the Legal Medicine Organization in sari, Mazandaran between 2007 - 2013. Exposure was documented by the official reports in the original hospitals and war zones. All patients had acute respiratory symptoms after exposure to SM gas and kept carrying pulmonary disease up to their deaths .All patients having previous lung and heart diseases (before exposure), history of smoking and addiction were kept out . Demographic characteristics and pathological findings of autopsied pulmonary systems were examined

Result: All cases were male with median age of 46 years suffered from sort of pulmonary diseases .The most common lung complication was chronic bronchitis/bronchiolitis (14 cases).The other complications were emphysema (9 cases) pulmonary infection(6 cases) usual interstitial pneumonia (2 cases) squamous cell carcinoma (2 cases) granulomatous disease (1 case) fibrosing pleuritis (1 case) respectively.

Conclusion: To sum up, we confirmed that almost half of the cases had chronic bronchitis/bronchiolitis .In respect of chronic persistent disease, we hope that our findings help in establishing protection program and new treatment ways to protect them constructively.

Keywords: Mustard gas; pulmonary complication; chemical warfare; cadaver

Abstract No: 182

Analysis of arterial blood gases values in patients with opioids poisoning

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Abstract

Background: The purpose of this study was to investigate the arterial blood gases (ABG) status in poisoned patients by different opioids. And evaluate its relationship with different variables.

Materials & Methods: Patients with opioid poisoning were evaluated for ABG findings on admission. The results with respect to ABG analysis were compared.

Results: Most patients were drowsiness (67.74%). Miosis was observed in 87.10% patients. The average of pH was 7.30 ± 0.01 (range, 7.14-7.49). Mean of PCO₂ was 50.47 ± 1.96 (mmHg) (range 37.20-85) and the average of HCO₃ was 24.23 ± 0.74 (mmol/L) (range, 14.20- 33.70). There was a significant correlation between arterial pH and level of consciousness (P value = 0.03 R= 0.37). The average of oxygen saturation (SaPO₂) in patients with low pH was 52% (SD=30.51) and in patients with normal pH was 70.40% (SD=22.73). The mean (SD) of Respiratory rate in patients with low pH was 15 (4) per minute, and in patients with normal pH was 14 (6) per minute. The mean (SD) of systolic blood pressure in patients with low pH was 114 ± 14 (Min=93, Max=145) mmHg, and in patients with normal pH was 113 ± 15 (Min=90, Max=130) mmHg. There was no significant difference in mean of heart rate in patients with different level of pH. All patients with normal pH survived without any complications. However most of the patients with low or high arterial pH, survived with complications.

Conclusion: In most patients with opioid poisoning, PCO₂ increased and pH declined which may be due to respiratory depression in opioid poisoning. Also some patients had low bicarbonate concentration in ABG analyses which show severe toxicity due to hypoxia in these patients.

Key words: Opioid, Poisoning, Respiratory Acidosis, Hydrogen-Ion Concentration

Abstract No: 310

Successful treatment of multi-organ toxicity by oral explosive agent: A case report

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Abstract

Background: Acute poisoning by oral mixed hazardous materials can lead to multiorgan toxicity and represents a special challenge in clinical medication, principally if little is known about the effects of the agents involved. This is especially true when chemical industrial substances were swallowed, where a huge variety of toxic substances must be taken into account.

Case Presentation: This case report describes the managing of this possibility life threatening problem in a 21-year-old man with multiorgan system failure who developed gastrointestinal bleeding, anemia, renal dysfunction, alteration in visual acuity, seizure, jaundice and ascite due to multiorgan toxicity. This case successfully treated with repeated hemodialysis. The patient survived and he was discharged from hospital with an acceptable level of morbidity.

Conclusion: It is worth considering that in oral multi hazardous substances toxicity, without of specific antidote, hemodialysis seems the best treatment. The problems faced by the multiorgan toxicity and the issues concerned in the decision making process are discussed in the management of this extraordinarily overwhelming complication.

Keyword: multiorgan toxicity, explosive agents, hemodialysis, multiorgan failure

Abstract No: 288

Association of polymorphisms of NAD (P) H: Quinone Oxidoreductase 1

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Abstract

Background: Chronic obstructive pulmonary disease (COPD) is a slowly progressive condition characterized by airflow limitation, which is largely irreversible. The oxidant/antioxidant imbalance plays a critical role in COPD. NAD(P)H:quinone oxidoreductase 1(NQO1) is a part of the antioxidant defense system that protects cells from oxidative stress by maintaining antioxidant forms of ubiquinone and vitamin E and this enzymatic activity can be sufficient to protect against carcinogenesis. The NQO1 enzyme is polymorphic and the mostly studied NQO1 polymorphism is C609T which gives rise to a proline to serine amino acid change in the encoded protein and has been associated with reduced enzymatic activity. The aim of this study was to find an association between NAD (P) H: Quinone Oxidoreductase 1(NQO1) C609T polymorphism with the stages of disease in the cigarette smoking patient with COPD.

Material & Method: Two-hundred COPD patients and 100 healthy controls were included into the study. Demographics and smoking status were registered in a questionnaire. FEV1, FEV1%, FEF 25-75 were determined using spirometer and authenticated by the lung specialist doctor. COPD stage was determined according to their FEV1 and history respectively. Polymorphism of NQO1 C609T was determined using polymerase Chain Reaction- Restriction Fragment Length Polymorphism (PCR-RFLP). Logistic regression was used to analyze the association of NQO1 C609T polymorphism with the stage of disease.

Results: There was a significant relation between C609T polymorphism of NQO1 and stage of COPD as the frequency of T allele was higher in the patients with higher stage of disease. There was also a significant correlation between the C609T polymorphism and FEF25-75 and FEV1 in COPD.

Conclusion: Our result show that polymorphism of (NQO1) C609T might be a risk factor for higher stage of COPD. More studies with larger number of cases is recommended to confirm these findings.our result show that COPD patient who over express (NQO1) C609T have lower FEF25-75.

Keywords: NQO1 C609T polymorphism, COPD, Stage, Smoking, Lung function test

Abstract No: 287

Association of polymorphisms of Glutathione-S transferase gene (GSTM1 and GST T1 deletion) with the stages of disease and exacerbations in the cigarette smoking patients with chronic obstructive pulmonary disease (COPD)

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Abstract

Background: The role of oxidant/antioxidant imbalance and oxidative stress has been proven in the pathophysiology of chronic obstructive pulmonary disease (COPD). Glutathione-S transferase (GST) is a highly polymorphic enzyme involved in redox status of the cells and detoxification of various potential carcinogens present in the cigarette smoke. GSTT1-null and GSTM1-null are associated with lack of genes and are amongst the most frequent polymorphisms of GST. Relation of GSTT1 and GSTM1 polymorphisms with many diseases has been elucidated. The aim of this study was to find an association between GST M1 and GST T1 polymorphisms with the lung function tests, COPD stages and number of exacerbation in the cigarette smoking patient with COPD.

Materials & Method: Two-hundred COPD patients and 100 control case with history of cigarette smoking were included into the study. COPD stage and number of exacerbation during last year was determined according to their FEV1 and history respectively. Polymorphism of GST M1 and GST T1 was determined by polymerase chain reaction (PCR) followed by multiplex PCR to find an association between GSTM M1 and GST T1 polymorphisms with the number of exacerbation. Logistic regression used to analyze the association GST M1 and GST T1 polymorphisms with number of exacerbations and stage of disease.

Results: There was a significant association between GSTM1 polymorphism and stage of disease ($\chi^2(1, N=200)= 10.6, p=0.001$) as GSTM1-null was more frequent between patients with FEV1<50. There was also a significant association between combinations of GSTM1/T1 polymorphisms and stage of disease ($\chi^2(3, N=200)= 12.6, p=0.006$). Among the different parameters of spirometry, there were only significant association between GSTM1 polymorphism and FEV (B=6.5; CI: 1.8-11.3, p=0.007) and FEF25-75 (B=6.1; CI: 0.6-11.6, p=0.03).

Conclusion: GSTM1 null genotype is a genetic determinant of worse stage of disease in smoker COPD patients.

Keyword: GST T1, GST M1, Genetic polymorphism, COPD, stage, Exacerbation

Abstract No: 126

Luteolin starts apoptosis signaling in mitochondria isolated from hepatocellular carcinoma hepatocytes

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Abstract

Background: Hepatocellular carcinoma (HCC) is a serious health problem throughout the world. Development of novel drugs without side effects for this cancer is crucial. Natural dietary agents have drawn a great deal of attention toward cancer prevention because of their wide safety margin. Luteolin (LUT), a bioflavonoid, some epidemiological studies suggest an inverse correlation between LUT intake and the risk of some cancer types. LUT can delay or block the development of cancer cells in vitro and in vivo by protection from carcinogenic stimuli and by induction of apoptosis via intrinsic and extrinsic signaling pathways.

Methods & Materials : Hepatocellular carcinoma was initiated by intraperitoneal injection of diethylnitrosamine (DEN) at 200 mg/ kg body weight for 2 weeks and promoted with dietary 2-acetylaminofluorene (2-AAF) (0.02%, w/w) for 2 additional weeks. Then rat hepatocytes were isolated with collagen perfusion technique and cancerous hepatocytes were sorted by flow cytometry. Finally mitochondria isolated from cancerous and non- cancerous normal hepatocytes were tested for any probable toxic effect of LUT. Result of MTT assay showed that treatment with LUT (1–100 μ M) significantly decreased the viability of HCC hepatocytes in a dose and time-dependent manner.

Results: Our findings also showed that LUT (17.5, 35 and 70 μ M) -induced cytochrome c release only in cancerous (BUT NOT non- cancerous) which was subsequent of increased reactive oxygen species formation, mitochondrial swelling and disruption of mitochondrial membrane potential. Apoptotic effect of LUT on HCC cells was demonstrated by annexin V-FITC/PI double staining analysis followed by flow cytometry technique.

Conclusion: Taken together our results suggest as a potent anticancer candidate against HCC.

Keywords: Luteolin, Apoptosis, Mitochondria, Hepatocellular carcinoma.

Abstract No: 464

Vitamin E as a novel therapeutic agent in Aluminum Phosphide acute poisoning: A randomized, controlled open label clinical trial

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Abstract

Background: Aluminium phosphide (ALP) is used as an agricultural fumigant in the world. It is a common cause of fatal intentional chemical acute poisoning in Iran. ALP produces phosphine gas, which is a mitochondrial poison and inhibit cytochrome C oxidase and leads to generation of reactive oxygen species (ROS). There is not specific antidote in this poisoning and treatment is supportive and symptomatic. The objective of this study was to evaluate the therapeutic effects of vitamin E on acute ALP poisoning.

Methods & Materials: This is an open label, controlled randomized clinical trials on ALP intoxicated patients which referred to Loghman-Hakim Hospital Poison Center during the first 6 hours after the onset of exposure. Patients randomly divided in two groups, case and control. Control group received only supportive symptomatic treatments. In addition case group received the same supportive and symptomatic treatment along with vitamin E (400 mg/BD, IM). The Thiobarbituric acid Reactive Substances (TBARS) as a biomarker of lipid peroxidation and total antioxidant capacity (TAC) of plasma were analyzed. The demographic, clinical, paraclinical and laboratory findings were evaluated. The data were analyzed with SPSS software (ver. 17) and differences with P value less than 0.05 considered as statistically significant.

Results: From total of 30 patients, 15 patients divided randomly in each control and case groups. No significant difference was observed between two groups according to gender, age, ALP ingested dose, severity of poisoning, TAC, blood pressures and blood gas parameters on admission time (P>0.05). Vitamin E administration induced significantly reduction in MDA level, hospitalization duration, need to intubation and mechanical ventilation (P<0.05). Mortality rate in case and control groups were significant difference (15% and 50%, respectively, P=0.02).

Conclusion: It is concluded that vitamin E has a therapeutic efficacy in ALP intoxicated patients.

Keywords: Aluminium Phosphide, Vitamin E, Poisoning

Abstract No: 467

A Descriptive Analysis of Phone Calls Made to the Shahid Beheshti Drug and Poison Information Center during 2012-2014

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Abstract

Background: Drug and Poison Information Centers (DPICs) act as a reliable source of information to guide the public and health professionals in order to prevent and manage poisonings caused by common household and occupational chemicals. DPIC located at the Shahid Beheshti University of Medical Sciences, Deputy for Food and Drug Affairs, was the main center in the country as well as EMRO countries, which had been in operation from 2010 to 2014.

Methods: This was a descriptive retrospective study on self-reported poisoning events made through phone calls to the Shahid Beheshti DPIC between June 2012 and April 2014. Data including demographic characteristics of callers (age and sex), type of poison and intention of poisoning were analyzed by reviewing the recorded phone calls.

Results: It was found that from 382,941 phone calls, most of them were inquiries about pharmaceutical products and 0.67% (2582 calls) of them were associated with poisoning. 21% of the poisoning calls were intentional in the age group of 16-55 years old. The age group of 0-6 years old was the most unintentional poisonings (40%) age group. Pharmaceutical products were the main causes of poisonings (89.81%). Among the complementary medicines, Eucalyptus products have been the predominant (21%) cause of poisonings which was mistakenly taken instead of cold and cough syrups.

Conclusion: Data obtained in this study reveals that there should be special attention to the poisonings made by pharmaceutical as well as non-pharmaceutical products. This emphasizes the crucial role of DPICs in prevention and management of misadventures associated with drug abuse and misuse.

Keywords: Descriptive Analysis, Poisoning Phone Calls, Drug and Poison Information Center

Abstract No: 397

Epidemiological investigation of intentional and unintentional poisoning cases assisted by Guilan Province 115 emergency 2013-2012

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Abstract

Background: Poisoning is a main problem threatening health throughout the world. Because of presence of such cases in statistics of cases assisted by pre-hospitalization emergency services, the present paper aims to epidemiologically investigate intentional and unintentional poisoning cases assisted by Guilan Emergency Services during the period between 2012 – 2013.

Materials and Methods: The present paper is a descriptive – cross-sectional research analyzing patients' status and the month of occurrence through providing and reviewing a checklist involving variables such as age, gender and the type of intentional or unintentional poisoning. Data are analyzed using SPSS 19 in significance level of 0/05

Results: According to results, among the total number of 4351 poisoning cases in Guilan occurred from 2012 to 2013,) 2/74% (were males and) 8/25% (were females. Most cases occurred in the age range of 26 – 30 years (37.3%). Most cases of intentional poisoning included abuse of pharmaceuticals and medicine, especially Benzodiazepines and most unintentional cases included addictive drug abuse. The highest occurrence rate belonged to June.

Conclusion: The most prevalent type of intentional and unintentional poisoning cases is drug-induced poisoning. Hence, authorities are asked to pay more and specific attention to the issue.

Keyword: Intentional and unintentional poisoning / Emergency medical service

Abstract No: 398

Study of variety of toxicity in the poisoned cases rescued by emergency medical sciences center in guilan2010-2013

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Abstract

Introduction: Today, toxicity has become one of the major social problems due to the increased number and variety of chemical materials entering the human cycle. Also, it would get more importance considering the increasing development of different kinds of different kinds of poisons and lethal medicines. Determining the prevalence of various toxicity can serve as a suitable pattern for public education, available to respective authorities.

Objective: Prevalence study of variety of toxicity in the poisoned cases rescued by ems of guilan in2010-2013

Materials and Methods: This is a descriptive study conducted on5406 poisoned cases by Emergency in2010-2013, in terms of age, gender and kind of toxicity have been evaluated and research data were statistically analyzed in SPSS software. Data are analyzed using SPSS 19 in significance level of 0/05.

Results: According to results, among the total number of 5406 poisoning cases in Guilan occurred from 2010 to 2013, (67/7%) were males and (32/3%) were females. Most cases occurred in the age range of 26 – 30 years (19/7%). Most cases of intentional poisoning included abuse of pharmaceuticals and medicine, especially Benzodiazepines and most unintentional cases included addictive drug abuse. The highest occurrence rate belonged to June.

Conclusion: Considering the fact that young people account for the most poisoned case and the most common kind of toxicity is drugs and improper use of medicines, providing proper education to families specially youth about the dangerous complications of drugs and keeping and using medicines in the house seems to be necessary.

Keywords: Toxicity/ Emergency medical service

Abstract No: 451

Evaluation of oxidative stress status and effectiveness of antioxidant therapy in acute aluminum phosphide intoxicated patients: A review

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Abstract

Background: Aluminum phosphide (ALP) is a common cause of fatal acute chemical poisoning in Asian countries including Iran. As there is not a specific antidote for this poisoning, treatment based on only supportive and symptomatic. The main mechanism which has been reported in ALP poisoning is oxidative stress. Previous studies in animal models showed that induction of oxidative stress during ALP poisoning. Also, antioxidants may have a therapeutic effect in this poisoning. Despite these studies, the therapeutic effectiveness of antioxidant therapy in human ALP poisoning remains unclear. The aim of this article is to determine the evaluation of oxidative stress status and antioxidants therapy in patients with ALP acute poisoning.

Methods & Martials: We searched the Pubmed, Scopus and Google Scholar databases from 1990 up to March 2015. We used the following key words: Aluminum phosphede, Poisoning, Antioxidant, Oxidative stress, Treatment. The searches were limited to English language articles.

Results: Nine human clinical studies and case reports have been performed assessing oxidative stress parameters during ALP acute poisoning and the efficacy of antioxidant therapy (N-Acetyl Cystein (NAC) and magnesium sulphate) in management of ALP acute poisoning. The results showed that oxidative stress biomarkers (e.g. malondialdehyde (MDA), total thiol, superoxide dismutase and catalase) have been changed in ALP poisoning patients. NAC and magnesium have antioxidant effects and improve antioxidant defense of the patients and reduce lipid peroxidation parameters and finally decrease the mortality rate in the patients.

Conclusion: Oxidative stress has a main role in toxic mechanisms of ALP poisoning. Although there are a few clinical trials on NAC effects in ALP acute poisoning, the studies demonstrated a light landscape of administration of antioxidants as a therapeutic measure for treatment of this type of poisoning.

Keywords: Aluminum phosphide, Antioxidant, Treatment, Poisoning

Abstract No: 437

Evaluation of toxicological laboratory findings in death cases due to hanging

Zahra Farhadi Kouhpaye, Mohammad Pourfakharan, Faezeh Farhadi Kouhpaye

Abstract

Background: Suicide is one of the important reasons of death all of the world. Hanging is one of the most formal ways of suicide. This research was designed to assay post mortem toxicology laboratory findings of subjects with hanging death in Iran.

Method & Materials: This study was carried out on reported cases with hanging death to Shahid Beheshti Hospital of Iranian Legal Medicine Organization during 2011 to 2013. In this research, toxicologic researches were carried out on urine samples using thin layer chromatography and gas chromatography mass spectrometry (GC mass) techniques. For instances which need confirmation, another sample was also prepared from blood or the vitreous. Autopsy and scene investigation observations were also studied and entered into a special checklist.

Results: In general, 90 men (90%) and 10 women (10%) were evaluated. Suicide was proven in one hundred and one (95%) corpses and according to primary scene investigations and autopsy findings three (5%) cases were highly suspicious of non-suicidal events which eventually were clarified with the help of toxicology tests. No drug metabolites, substance or ethanol were noticed in 60 (60%) cases. Among 36 cases with known substances, morphine was the most common substance which was found in 27 cases.. After plotting known substances against age groups, it was found that the presence of ethanol was predominantly higher in younger persons ($P = 0.04$).

Conclusion: Although the nature of hanging death can be clarified by scene observations, performing postmortem toxicology tests are also crucial to specify suicidal, homicidal or accidental background. In this research morphine was the principle substance seen in suicidal hanging cases. Then, the opioid abuse can be find as one of the major risk factors of committing suicidal hanging in Iran.

Keywords: Morphine; Psychiatry; Suicide; toxicology laboratory findings

Abstract No: 436

Evaluation of predisposing factors of addiction to opium

Zahra Farhadi Kouhpaye, Mohammad Pourfakharan, Fatemeh Gholipour, Faezeh Farhadi Kouhpaye

Abstract

Background: Addiction to opioid substances is the most important difficulties from biosocially dimensions. There are multiple factors as predisposing reasons: Demographic characteristics, personalities, genetic factors, familial factors, environmental factors or dependency to opioid substances. On the other hand chronic pain is one of the predisposing factors of addiction. It can be as psychosocial stressor factors of substance use.

Methods & Materials: This research is a cross sectional study. In this study there are 127 randomized person that referred to one of the private leave addiction center. Then it take sample from referral persons. We delivered check lists include informations such as history of addiction, history of chronic pain, attenuation of pain (evaluation with visual analog scale) to persons. This study evaluates and analyses variable correlation of consumption of opioid substance and multiple probable factors in 127 persons referred to leave addiction center. Then information entered spss17.5 and analysed. Statistic tests include chi2 and t-test used.

Results: number of persons in this research was 127 male and age of referral persons was 20-48 years old. Average age was 34 yr. Chronic pain predominantly was one of the known risk factors for opioid substance use. Free occupation, mental disorder, familial difficulties and exit from family have strong correlation with opioid substance use. (p value < 0.05). The most common age incidence was 20-25 years old and the most common substance use was opioid. Inhalation method was the most common method.

Conclusion: because having chronic pain is one of the predisposing factor for addiction, recurrency is under evaluated. Because of low sample, we can not conclude more benefit. We need broad sample collection.

Keyword: addiction, chronic pain, visual analog scale

Abstract No: 119

Comparative Study of Para Clinical Parameters in Pediatric poisoning - Clinical Pediatric Toxicology Unit –Imam Reza Hospital- Mashhad –Iran 1390(2011-2012)

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Abstract

Background: The purpose of this study is, evaluation of para clinical parameters in the most prevalent cases of children poisoning.

Material & Methods : This cross sectional study was conducted on 398 cases of pediatric poisoning in pediatric clinical toxicology unit of Imam Reza Hospital (2011-2012) .Standard demographic information and Para clinical data were recorded(via the electronic recording system of the hospital) .The results were compared with normal range for age or defined criteria according to specific subject(one sample T test) and then compare with each other (one way Anova test . The software used for analysis of the data: SPSS Version 11. Significant results were reported.

Results: The most common kind of pediatric poisoning were 6 types. The first three were 1- methadone poisoning were 159 cases that 99 Para clinical results were available, mean age 44 month, 59% male, 2- opium poisoning were 135 cases, that 69 Para clinical results were available, mean age 9.7 months, 70% male, 3- 53 cases of benzodiazepine poisoning that 31 para clinical results were available, mean age was 43months, 45% male. Mean age of opium poisoning was significantly lower than other types of poisoning .Leukocytosis and hyperglycemia and decrease of oxygen saturation was prominent in methadone poisoning. Thrombocytosis and leukocytosis were prominent in opium poisoning. GFR in methadone and opium poisoning was lower than normal .In all types of poisoning, the HCT was lower than -2SD for age.

Conclusion: In some type of poisoning especially opioid poisoning, hyperglycemia and leukocytosis and decrease of oxygen saturation are prominent. Decrease of glomerular filtration rate is common in opioid poisoning. Some types of poisoning may be mentioned as differential diagnosis in hyperglycemia, leukocytosis, thrombocytosis, or decrease of O2 Saturation.

Keywords: pediatrics, toxicology, poisoning, para clinical

Abstract No: 575

VAP or poisoning; which one has more effect on patients' outcomes in toxicological ICU?

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Abstract

Background: Ventilator-associated pneumonia (VAP) is the main cause of acquired infections in ICUs. Every year, millions of people suffer from poisoning by various substances. Our aim was to determine the association between VAP incidence and different kinds of toxicity among Toxicological ICU (TICU) patients.

Method & Materials: Poisoned patients with diagnosis of VAP were enrolled to our retrospective study at TICU of Loghman Hakim Hospital. Data was collected through the medical records. The statistical analysis was performed with SPSS (version 16, Chicago, IL, USA).

Results: Among 675 patients with MV > 48 h, 150 patients had the diagnosis of VAP. Mean age was 36.6 years. 74.7% were males. Intentional poisoning was 70.3%. The incidence of VAP was 22%. The higher incidence of VAP was recorded in anti-depressants and opioid toxicities. The majority of bacterial isolates (81.3%) were multi drug resistance. *MRSA* accounted for 50.7% of VAP cases. Non survivors' hospital length of stay (mean = 18.7days) was significantly higher than survivors (12.8). The hospital length of stay in VAP patients was highest in the *Acinetobacter* spp (mean > 20 days). Mortality rate of VAP cases was 18.6%.

Conclusion: No specific association was detected between incidence of VAP and different kinds of toxicity, while Anti Depressants and opioids had high VAP incidence, in a Quarter of this population. It is noticeable that pesticide had the lowest incidence for its short hospitalization. In our TICU, *MRSA* and *Acinetobacter* spp were the main agents leading to VAP and prolonged ICU stay, respectively.

Keyword: Ventilator-associated pneumonia; poisoning; incidence; ICU

Abstract No: 577

Survey epidemiological of deliberate poisoning and its effective factors in patients referred to hospital in Imam Reza in Mashhad

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Abstract

Background: Deliberate poisoning is the one of the important reasons for mortality in the world and issue is more important because of various types of pesticides and toxic drugs are increasing. Further epidemiological studies should assess to identify appropriate data and their general applicability to other populations. The present study aimed to determine the epidemiology of deliberate poisoning and its effective factors in patients referred to hospital in Imam Reza in Mashhad.

Method & Materials: This is Cross-sectional study. The study included 240 patients with different poisoning referred to Imam Reza hospital in Mashhad. Data were collected from summer 2014 by Census sampling. The data was gathered by Demographic questionnaire and effective factors of poisoning checklist. Data were analyzed using SPSS software version 19 and statistical tests based on different variables.

Results: The results showed that the study population of 143 (59.6%) were women and 97 (40.4%) were male and drug poisoning with 74.1% had the highest prevalence among different types of poisoning. There was significant relationship between age and type of poisoning ($p < 0/001$), but there was no significant relationship between age and cause of the poisoning and the results ($p > 0/05$). Also, A significant relationship was found between the type of poisoning and educational degree ($p > 0/05$), but most of poisoning among those with primary education and illiterate (56.3%). Also, there was no significant relationship between chief complaint and gender ($p > 0/05$) So that deliberate poisoning was the main reason for referral in both groups. But there was a significant relationship between gender and type of poisoning ($p < 0/05$). The results showed that both men and women have chosen the more effective approach to drug intoxication than self-mutilation and Hanging self-off.

Conclusion: As major factors must be considered in the development of deliberate poisoning, identifying and reducing these factors are important as well as factors related to enhancing protective factors. So it's propose to inform appropriate for increasing information about the side effects of the poisoning of the population and reduce the occurrence of these events through health centers and organizations in community.

Keywords: Epidemiology, poisoning, drug abuse

Abstract No: 578

Prevalence of Deliberate Poisoning and Its Relationship to Demographic Variables in patients referred to Imam Reza hospital in Mashhad

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Abstract

Background: Deliberate of poisoning is most important of emergency psychiatry and up to 2020 the prevalence rate will 10 to 20 times. The most common method of deliberate of poisoning by medication and Survey of epidemiologic and identifying the characteristics of people involved with a health problem it's very important. The aim of this study was to evaluate the prevalence of deliberate poisoning and its relationship to demographic variables referred to Imam Reza in hospital Mashhad.

Method & Materials: This is descriptive-correlation study. The study included 240 patients referred to Imam Reza hospital in Mashhad. Data were collected from summer 2014 by Census sampling. The data was gathered by questionnaires. Data were analyzed using SPSS software version 19 and statistical tests based on different variables.

Results: The majority of participants 59.6% of patients were women, 61.7% were married and 41.5% were high school or college education and 37.5% reported a history of previous of poisoning. Most chief complaint of the patients were deliberate poisonings 98.3% and the drug abuses 74.1% in 88% of female and 22% of male. The results showed there was significant relationship between age, sex and type of poisoning ($p < 0/05$) but there was no significant relationship between education level and type of poisoning ($p > 0/05$). Also there is a significant relationship between marital status, history of previous of poisoning and prevalence of poisoning ($p = 0/000$), but there was no significant relationship between marital status and type of poisoning ($p > 0/05$).

Conclusion: The results showed that deliberate poisoning had the high prevalence so it's necessary to provide knowledge and awareness about the incidence of side effects and poisoning problems for people. Also according to social, environmental and cultural factors, nurses can education and intervention to improve methods of decisiveness and change in lifestyle and emotional status to reduce the incidence of deliberate poisoning in susceptible people and they help to maintain a healthy and happiness community.

Keywords: Prevalence, Poisoning, Demographic Variables

Abstract No: 557

Consideration of Poisoned that exposure to pesticides (organophosphates) (in Poisoned patients that referred to Mashhad Imam Reza hospital in 1392)

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Abstract

Background: The toxicity of pesticides is the most common type of poisoning that may happen for different purposes incidental to the use of those compounds. Also, studies have shown that most reports of poisoning with pesticides in order suicide.

Method & Materials: This study aimed to determine the prevalence of pesticide poisoning(organophosphate) In patients admitted in Mashhad Imam Reza hospital in 1392) we searched the toxicological laboratories items RBC- CHE(RBC- Acetylene-cholinestrerase) & S-CHE (Activity serum) then the questionnaires was full for patients. & data were analyzed by SPSS 17.5.

Results:

1. All of poisoned patients that referred in 1392 was 7100.
2. The poisoned patients by pesticides (organophosphates) were 301 (%4/2 of total patients),
3. %44 poisoned patients with pesticides (organophosphates) were male and56% were female.
4. The most common age range in 21-30 years was %42 of total cases. & at range of under 20 years was %34 of total cases.

Conclusion: The findings indicate that suicide by pesticides (organophosphates) have a high incidence and mortality, it should be seriously considered. The teaching staff with the proper care and treatment of poisoning is important & the poisoned patients are with low aged. For example 34% of them were under 20 & 42% were 21- 30. & this age have a maximum effect in social items. So we must to have an education programs to reducing their tendency to suicide & use of the organophosphates.

Keywords: poisoning- organophosphates- low age – women

Abstract No: 86

Formaldehyde metabolism Polymorphism in employees of some Melamine Dinnerware Manufactures

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Abstract

Background: Formaldehyde (FA) has been extensively used in the chemical industry such as melamine, phenol-formaldehyde, polyacetal, FA-based resin. The International Agency for Research on Cancer (IARC) has classified FA as a group 1 carcinogen. Alcohol dehydrogenase III (ADH3) is the key enzyme for the metabolism of formaldehyde which plays vital roles in the cancer etiology. In this study ADH3 polymorphism was investigated in workers exposed to FA from some factories of Dinnerware manufactures.

Materials & Methods: The study was carried out ADH3 genotype in some dinnerware workshops for 54 workers. Polymorphism of ADH3 was performed using PCR on white cell DNA.

Results: The ADH3 gen gives two alleles including ADH3*1 and ADH3*2 which code respective subunits $\gamma 1$ and $\gamma 2$. 4% of employees had ADH3 (1-1), and 28% ADH3 (2-2) genotype. It seems, ADH3 (1-2) genotype was more frequent among investigated people. Finally about 40% of subjects have the code of subunits $\gamma 1$.

Conclusion: Subunits $\gamma 1$ was reported with higher activity than $\gamma 2$ towards metabolism. Thus, the susceptibility of subjects to cancer risk increased with the alleles ADH3*1. In the investigated samples about 40% of subjects have the allele with higher metabolism activity. Overall, these information could be used for assessment of health risks in the recruitment tests.

Keyword: Alcohol Dehydrogenase III, Polymorphism, Formaldehyde, Melamine Dinnerware

Financial support of the study by: Department of Occupational Hygiene, School of Public Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

Abstract No: 538

Development and validation of a DLLME-HPLC-UV method for determination of warfarin in plasma and its clinical application

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Abstract

Background: Warfarin is one of the most commonly prescribed oral anticoagulant for prevention of thromboembolic events. The effect of this drug is measured by monitoring prothrombin time expressed as International Normalized Ratio (INR). However, there are several time consuming and expensive analytical methods like GC-Ms and HPLC-Ms for the measurement of anticoagulants in plasma, an efficient extraction procedure coupled to a simple and no expensive method such as HPLC-UV applicable in any clinical laboratory is highly demanded. In this study, a new generation of dispersive liquid-liquid micro extraction (DLLME) coupled to a HPLC-UV was developed and validated for determination of warfarin in human plasma and applied to clinical real samples.

Methods & Materials: Warfarin was extracted from the 0.75 ml human plasma samples by a DLLME method using 0.1 ml toluene and 0.7 ml acetonitrile as disperser. Warfarin was quantified by a developed and validated HPLC-UV method on a C18 (5 μ m, 300 mm \times 4.6 mm) column as stationary phase and methanol—50 mmol/l ammonium acetate buffer (pH 3.74) 65:35 as mobile phase with a flow rate of 1ml/min and injection volume of 25 μ l. In this procedure naproxen was used as internal standard.

Results: The developed method was linear in the range of 10 to 500 ng/ml. RSD% for both inter and interday precision were lower than 3%. Recovery of the analyte was greater than 95%. Enrichment factor of the extraction method showed to be more than 10.

Conclusion: It can be concluded that the method is simple and may be used reliably to determine warfarin concentration in plasma of the users and may applied every time INR is not informative.

Keywords: Dispersive liquid-liquid micro extraction, Warfarin, HPLC-UV, Therapeutic drug monitoring

Abstract No: 231

Association between polymorphism G-308A of TNF- α with the spirometric parameters and stages of disease in the cigarette smoking patients with chronic obstructive pulmonary disease (COPD)

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Abstract

Background: COPD is a leading cause of death and disability worldwide. There is a chronic inflammation phase that leads to fixed narrowing of small airways and alveolar wall destruction (emphysema). TNF- α is an inflammatory cytokine produced by macrophage, monocytes during acute inflammation and is responsible for a diverse range of signaling events within cell, leading to necrosis or apoptosis. TNF- α -308G/A polymorphism determine variability in TNF- α production in human. So, in this study we tested the association between this polymorphism and stages of disease in an Iranian population of COPD patients. The aim of this study was to study the role of TNF- α G-308A polymorphism with the stages of disease in the cigarette smoking patient with COPD.

Materials & Methods: Two hundred COPD patients and 100 controls included in this study. Demographics and smoking status were registered in a questionnaire. FEV1, FEV1% and FEF25-75 were determined using spirometer and authenticated by the lung specialist doctor. The FEV1 data were used to determine the COPD stages. Polymorphism of TNF- α -308 G/A was determined using PCR-ARMS. Logistic regression was used to analyze the association of TNF- α -308 G/A polymorphism with stages of disease.

Results: There was a significant correlation between TNF- α -308 G/A polymorphism and FEF25-75 in COPD ($p=0.02$; $\beta=-0.19$; CI= -18_ -1.5). There was insignificant correlation between TNF- α -308 G/A polymorphism and FEV1 in COPD. ($p=0.2$; $\beta=-0.11$; CI= -13_2). There was an

insignificant correlation between TNF- α -308 G/A polymorphism and FEVC in COPD ($p= 0.27$; $\beta= -0.09$; CI= -6.1_1.7).

Conclusion: Our results show that COPD patients who over express TNF- α (-308 A carriers) have lower FEF25-75.

Keywords: TNF- α -308 G/A polymorphism, COPD, Spirometry parameters

Abstract No: 266

Survival after oral poisoning with aluminium phosphide which leave out inner of chewing- gum; A case report

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Abstract

Background: Alminum phosphihde (ALP) or rice tablet is one of common pesticides in the world. Expusore of ALP with water, steam and gastric acid produces phosphin gas (PH₃) that results in poisoning. ALP poisoning used for suicide in adolescent and young addults. we report a successful treatment in a patient with poisoning by aluminum phosphide which ingested leave out inner of chewing- gum.

Case report: A 15-year-old girl presented with abdominal pain and vomiting with a smell of garlic and rotten fish. she was brought to the emergency room being circulatory affected, metabolic acidotic and he developed more episodes of arrhythmia. but she treated succesful with standard protocol treatment of ALP poisoning consisted of gastric lavage with potassium permanganate solution, oral administration of charcoal and sorbitol suspension, intravenous administration of sodium bicarbonate, magnesium sulphate and calcium gluconate.

Conclusion: Oral poisoning with aluminium phosphide is a very serious condition due to release of the toxic phosphine gas. Treatment is symptomatic.

Keywords: aluminum phosphide poisoning, inner of chewing-Gum

Abstract No: 385

Clinical Signs and Hospitalization Duration in patients with Tramadol Intoxication

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Abstract

Background: Regarding increasing tramadol toxicity in recent years due to usage of tramadol as a drug for suppression of withdrawal symptoms and high availability of this drug, we did a survey on the frequency of tramadol intoxication symptoms, duration of admission and complication of the patients.

Materials & Methods: We conducted a cross sectional study, in which information of every patient with tramadol toxicity admitted in Ardabil Emam Khomaini Hospital were gathered and analyzed.

Result: From 184 cases, 76.6% were men. The mean age of them was 24 ± 7 years. 40% of them had positive history of substance abuse. 34% of patients had chronic ingestion of tramadol. The most common chief complaint was CNS depression (57%) followed by seizure (25%), bradypnea (18%), tachycardia (25%), and hypertension (7%). Active charcoal (89%), gastric lavage (81%), naloxane (25%), anti convulsants (11%), and intubation and ventilation (5%) were done as therapeutic acts. The most common complication in patients was aspiration pneumonia. Two (1.1%) patients died. There were significant relationships between tramadol dose and seizure ($P = 0.036$), ataxia ($P = 0.002$)

Conclusion: Tramadol overdose cause CNS depression, respiratory depression, tachycardia, hypertension, and seizure; these symptoms could be from both effects of tramadol either on mu receptor or inhibition of monoamine reuptake.

Keywords: Tramadol, Toxicity, Overdose

Abstract No: 253

Heart failure in a 40 y/o female following Aluminum phosphide poisoning

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Abstract

The patient is a 40 y/o women , who ingested Aluminium phosphide powder as a Suicidal attempt After ingestion she developed nausea and in one hour period was transferred to Emergency department At the entrance to ED, She was fully oriented & her vital sign showed BP: 85/50 mm/Hg PR: 110/mm RR: 22/min T: 37c

ABG: PH: 7.22 pco2: 45.1 HCO3:18.6

In the patient past Medical history there were no hx of heart disease

The patient was transferred to toxicology center in Razi's Hospital and admit in ICU. ABG showed Metabolic acidosis PH: 7:13 PCO2: 44.1 HCO3:14.7 in the third day of hospitalization at 23 PM. The Pt developed respiratory distress & retrosternal chest discomfort and echocardiography reveal LVEf 20-25% with regional wall motion abnormality. After 5 days Medical treatment in CCU the Pt. discharged from Hospital. Angiography after one week was normal and Echocardiography showed LVEf 50-55% after 70 days. Patients who are poisoned with Alp due to its corrosive effects will develop epigastric Pain. Due to the mitochondrial Toxicity and cardiac complication of this poison these Victims need special attention and care.

Keywords: aluminium phosphide, poisoning, heart failure

Abstract No: 391

Evaluation of Combination Therapy of Hyper Insulin Euglycemia (HIE) protocol with antioxidants in Aluminum Phosphide Acute Poisoning

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Abstract

Background: Aluminum phosphide (AIP) acute poisoning is a common fatalchemical poisoning in Iran. Due to the lack of specific antidote, the mortality rate is high and treatment is only based on supportive and symptomatic measures. The aim of this study is to evaluate the efficacy of Hyper Insulin Euglycemia (HIE) protocol in combination with vitamin E and N-Acetyl Cystein (NAC) – as antioxidant agents- in patients with acute AIP poisoning.

Methods & Martials: This study performed as an open label controlled randomized clinical trial on patients with acute AIP poisoning admitted to the Intensive Care Unit (ICU) of Loghman Hakim Hospital Poison Center, Tehran, Iran during 2013-2014. Patients with inclusion criteria were divided randomly to two groups: control (recipient of conventional therapy (gastric lavage, bicarbonate, calcium gluconate and vasopressor therapy) along with vitamin E and NAC) and case (treated with HIE protocol and vitamin E and NAC along with conventional symptomatic and supportive measures). Demographic, clinical, paraclinical and laboratory finding were evaluated in the groups. Data were analyzed with SPSS software (ver. 22) and differences with P value less than 0.05 considered as statistically significant.

Results : A total of 76 patients with AIP poisoning, 15 patients considered as control and 61 patients considered as case group. There were not any significant differences between two groups according to gender, age, ingested dose of AIP, time between onset of poisoning and admission on ICU, systolic and diastolic blood pressure, heart rate, blood sugar, blood gas parameters (pH, PaCO₂, Base Excess, serum bicarbonate), serum electrolytes concentration and Liver enzymes concentrations on admission time ($P > 0.05$). HIE with antioxidants therapy did not have any significant difference on duration of hospitalization, need to intubation and ventilation, improvement of clinical and paraclinical parameters in case group in comparison with control.

Mortality rate in case and control groups showed no significant difference (60.7% vs. 86.7, respectively, $P=0.058$).

Conclusion: The HIE protocol did not any significant clinical efficacy in ALP acute poisoning.

Keywords: Hyper Insulin Euglycemia (HIE), N-Acetyl cysteine (NAC), Vitamin E, Aluminum phosphide, Poisoning

Abstract No: 387

Poison-induced seizures in 66 patients: Causes, treatments

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Abstract

Background: Poisoning is one of the major causes of seizure in emergency medicine. Because of the varying availability of drugs in different areas and insufficient control of the sale of some dangerous industrial substances, the causes of seizure in poisoned patients may be differ in our society. In this study, we examine the causes of seizures in poisoned patients in Ardabil and their outcomes.

Materials & Methods: This retrospective and analytical-descriptive study investigated the sex, age, type of poison, presence and type of seizure, seizure treatment and outcome from the records of 908 hospitalized poison victims from 1391-1393 in poison emergency departments in Emam Khomeini Hospital. Data was analyzed by one-way analysis of variance and chi square tests using SPSS.

Results: Of the 908 patient records examined, 66 patients developed seizure. Seizure was more common in men (33 patients), and most common in the 15-40 year age group (28 patients). The most common causes of seizure were tricyclic antidepressants (TCA) (39.7%), organophosphates (17.5%), carbamazepine (7.9%) and organochlorines (6.3%). However, status epilepticus was more common in organochlorine (25%), organophosphate, TCA (18.75%), and carbamazepine (12.5%) poisoning. There was a negative relationship between age and type of seizures. Seizure was not related to previous history of seizure. Midazolam alone (25%) was the most effective drug for controlling seizures. Death occurred in six patients with or without renal complication. The mortality rate among poisoned patients with seizure was 37.5%. Conclusion: The incidence of seizure in our study reflects the availability of certain drugs and toxins that require more steadfast control. Midazolam, with its low side effects, may be the drug of choice for the treatment of status epilepticus in poisoning.

Keywords: Seizure, poisoning, status epilepticus.

Abstract No: 419

Assessment of effective factors in poisoning with Aluminium phosphid in patients referring to Rasht Razi hospital during 2008-2013

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Abstract

Background: Descriptive epidemiological study has shown that Poisoning with Aluminum phosphid is a problem health in low and middle income countries. The aim of this study was to analyze records of Poisoning with Aluminum phosphid from hospital records, to describe a reality feature of problem, it can help to follow up Poisoning with Aluminum phosphid prevention policy.

Methods & Materials: In this descriptive and retrospective study, we gathered data from Razi hospital records in Guilan province in northern Iran, during March 2008 to March 2013. A checklist was used for data collection and analysis was done by SPSS 18. To analysis data, Chi square, Mann Withney and multiple logistic regression were used.

Results: Overall, 923 poisoning with Aluminum phosphid cases with mean age 35.26 ± 15.83 years were identified. Males were 54.8% and females 45.2%. During the five years period covered by the study, the mortality rate was 389 per 1000 at baseline to 589 per 1000 at endline. Risk factors for Poisoning with Aluminum phosphid in this study were gender, age, number of Tablet consumption. Alcohol, BP systolic, but age and BP systolic are predictor for mortality due to Poisoning with Aluminum phosphid.

Conclusion: Results of this study showed that lowering systolic blood pressure and aging, are predicting factors in mortality of Aluminum Phosphid poisoning and can make an important role in remedial planning of patients. Sufficient education, preventive proceedings and proper treatment is seemd to be necessary. Regarding to type this study (retrospective) for gathering more data and exact analysis, it is recommended to prospective study for evaluation of predicting factors, exactly.

Keywords: poisoning, Aluminium Phosphide, Epidemiology, mortality, Iran

Abstract No: 418

Epidemiologic investigation of Demographic information, pattern and consequences of alcohol use and management plan in patients with alcohol intoxication referred to Razi Hospital during 2008-2012

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Abstract

Background: Alcohol toxicity is a growing issue in the entire world. In developed countries the main cause of mortality and trauma is alcohol abuse among youth and adolescence. Alcohol abuse is correlated with other high risk behaviors such as tobacco and cannabis abusing. Overall, alcohol abusing is the social and medical problem. It is a spectrum of disease from psychological and medical related to alcohol. The aim of this study was to investigate the epidemiological features of alcohol toxicities in toxicology department of Razi hospital of Rasht.

Materials & Methods: It is descriptive cross sectional study which checked the all of files of patients with poisoning of alcohol that referred to toxicology department of Razi hospital of Rasht among 2008 until 2012. All demographic, symptoms and sings, lab tests and treatment strategies were recorded and descriptive analysis was performed by SPSS ver. 18.

Results: Most of the patients abused alcohol in March and was at the 3th decades of their life. Most of them was man and single and do not have any work with educational level of below the high school diploma. Nausea and vomiting by neurological signs such as visual problem and lost of conciseness was the frequent signs which patients had. The average of laboratory tests was in the normal range. Most of the patients treated with O₂ therapy and dextrose water infusion.

Conclusion: Most of the patients were in the second and third decades of age and more education for prevention is needed.

Keywords: Epidemiology, Alcohol Poisening, Adolescence

Abstract No: 422

Therapeutic effects of HESA.A in acute organophosphorous pesticide poisoning

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Abstract

Background: Organophosphorous compounds still remain on top of the pesticide-induced intoxication death toll list despite the widely-known antidotes available for treating the condition. Anti-oxidants, namely HESA-A, a sea-derived compound recognized for its anti-inflammatory features, were used as adjunct therapy in treating moderate-to-severe organophosphate intoxication.

Methods & Material: A total number of 64 patients diagnosed with moderate-to-severe organophosphate intoxication were divided into three groups of A, B and C, with 20, 22 and 22 members respective. Group A were given the conventional treatment of Atropine as well as Pralidoxime whereas the other two received 20 and 50 mg of HESA-A per kg daily in order as adjunct therapy. Owing to the insignificant difference between groups B and C, the two were regarded as one in the end.

Results: There has been no insignificant difference between the two groups in terms of demographic data as well as clinical presentations. The conventional therapy dosages [Atropin ($p=0.081$), Pralidoxime ($p=0.268$)] were not different either for the two agents in both groups. The average admission period was reported to be 7.3 ± 9.0 and 5.1 ± 5.7 in the toxicology ward and 2.6 ± 6.3 and 1.2 ± 3.1 in the ICU, respectively, which were also insignificant ($p>0.05$).

Conclusion: Organophosphates were reported as the most common causes of pesticide-related agents. Adjunct therapy with HESA-A has neither proved to be effective nor has caused side-effects.

Keywords: Organophosphorous pesticide, HESA.A, Phytotherapy

Abstract No: 408

Report of one recognition of an unusual drug (methenamine)

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Abstract

Background: The case is a 29 years old nurse that is found died, in nursing room. There was effects of injections in her hands.

Methods & Materials: Samples include of muscles of injection areas, blood & stomach contents was send to Guilan legal toxicology lab. In TLC [1], the specific navy spots recognized in muscle samples & regular spots recognized in all of the samples. For confirming, the samples tested by HPLC [2] & GC_MS [3]. In GC_MS, pethidine was found in stomach contents & hand muscles, also in the muscles “Methenamine” [4] was found. Methenamine is so complicated that creates during metabolization in the body. On the other hand it is so unfamiliar & dangerous to use as a normal defection drug, so how we justificate GC_MS results? Consult the Dr of the case, we were informed that the muscles samples lied in the formalin before sending to toxicology, by mistake. With the probability of recognition of byproduct of synthesis or a derivative of formaldehyde. Two samples of formaldehyde tested by GC_MS. Methenamine recognized .It decomposes at an acidic pH to form formaldehyde and ammonia. (For example in the stomach) So the reason of UN usual reasons was impurity of formaldehyde

[1] Thin Layer Chromatography

[2] High Performance liquid Chromatography

[3] Gas Chromatography Mass Spectroscopy

[4]. Methenamine Mondelate, Hexamethylenetetramine or methenamine is a heterocyclic organic compound with the formula $(CH_2)_6N_4$ As the mandelic acid salt (generic methenamine mandelate, it is used for the treatment of urinary infection.

Keywords: TLC ‘HPLC ‘GC_MS, Methenamine, Formaline

Abstract No: 402

Prevalence of anemia in women with deliberate self-poisoning admitted to Ayatollah Taleghani hospital, Urmia, Iran

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Abstract

Background: Deliberate self-poisoning is the most common method for suicide in women of developing countries. Complete blood count (CBC) results of most admitted women in poisoning ward indicated that they had anemia, so, authors hypothesised that anemia may be a triggering or predisposing factor for suicidal attempt in females. This study was designed to assess the frequency of anemia in women with deliberate poisoning.

Material & Methods: In this descriptive cross-sectional survey, 200 women with deliberate self-poisoning were studied in Poisoning Treatment Center of Ayatollah Taleghani Hospital, Urmia, Iran, in the beginning of 2014. Anemia was recognized with respect to hemoglobin (Hb), hematocrit (Hct), mean cell volume (MCV), mean corpuscular hemoglobin (MCH) and mean corpuscular hemoglobin concentration (MCHC) in the first patient's CBC results after admission.

Results: The mean (\pm SD) age of the studied women was 27.02 ± 10.36 years. Previous history of anemia was reported by 35.5% (n=67) of patients from which 22.5% (n=45) tried to treat their anemia. Mean (\pm SD) of Hb and Hct of all patients were 12.31 ± 1.06 g/dL, and 37.79 ± 6.02 percent, respectively. Mean (\pm SD) of MCV, MCH and MCHC were 84.82 ± 6.33 femtoliters/cell, 28.83 ± 7.61 picograms/cell and 32.57 ± 1.76 g/dL, respectively. Obvious anemia was seen in 35.5% (n=71) of studied women.

Conclusion: Although the sample size of our study was small, but, frequency of anemia in this study (35.5%) was not significantly different from prevalence of anemia in the general population (30%-33%). Therefore, it seems that anemia is not a related or predisposing factor for suicidal attempts in females. We suggest further investigations in this regard with more sample sizes.

Keywords: Anemia, Frequency, Suicide, Deliberate Poisoning, Urmia, Iran

Drug & Herbal Toxicology

Abstract No: 150

Protective and antioxidant effects of *Pinus eldarica* stem bark hydroalcoholic extract on H₂O₂- induced oxidative stress in human umbilical vein endothelial cells (HUVECs) damage

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Abstract

Background: *Pinus eldarica* has anti-inflammatory, antioxidant and anti-cancer effects. This study aimed to investigate the protective and antioxidant effects of *Pinus eldarica* stem bark hydroalcoholic extract on the H₂O₂-induced oxidative stress in the human umbilical vein endothelial cells (HUVECs).

Materials & Methods: Cell viability and oxidative status were assessed on the H₂O₂-induced oxidative stress in the HUVECs pretreated by (25-1000 µg/ml) *Pinus eldarica* stem bark extract. Cytoprotective effects of the extract was evaluated by 3-(4, 5- Dimethylthiazol-2-yl)-2, 5-diphenyltetrazolium bromide (MTT) assay. The intra and extra-cellular hydro peroxides concentrations and ferric reducing antioxidant power (FRAP) were determined in the pretreated cells.

Results: Pretreatment of the HUVECs with the *Pinus eldarica* extract at the concentrations of 100-1000 µg/ml decreased the cell death due to the exposure to H₂O₂ at a concentration-dependent manner. *Pinus eldarica* extract decreased hydro peroxides concentration and increased FRAP value in both intra- and extra-cellular fluid at different concentration ranges. Moreover, it did not show cytotoxic effects at the concentrations of 25-1000 µg/ml.

Conclusions: These findings revealed the antioxidant and cytoprotective effects of *Pinus eldarica* stem bark extract against H₂O₂-induced oxidative stress in the HUVECs. With regard to the beneficial vascular activity of *Pinus eldarica* bark extract, further investigations are suggested for understanding its clinical value in the human endothelial dysfunction and prevention and/or treatment of CVDs.

Keywords: *Pinus eldarica*, HUVECs, oxidative stress, antioxidant

Abstract No: 215

An overview on Atropa Belladonna Herb, to Investigate its Application Methods in Traditional Medicine, its Effects on Nervous System, and Modern and Traditional Methods of Poisoning Treatment with this Herb

Sevin Jeddi charandabi, Soheil Abbaspour

Abstract

Background: Atropa Belladonna is called Belladonna and Bell-dame in French and Belladonna and Deadly nightshade in English and its fruit is called Devil Berries. It is a herb from Solanaceae family and its scientific synonyms are A. acuminata Royal and A. lethalis Salisb. Indian scientists classify this herb into two Indian and European types that include: A. acuminata Roule ex Lindley as Indian Belladonna and A. Belladonna L. as European Belladonna which are two independent and separate types but have full properties and chemical composition. This perennial herb which is native to Europe, North of Africa and West of Asia has a long tradition as one of the classic poisons since ancient times. This herb is the source of Atropine Alkaloids and hyoscyamine.

Materials & Method : In this paper, considering the autonomic pharmacology uses and also therapeutic uses and significant toxic effects of this herb due to Tropane Alkaloids including Scopolamine and Hyoscyamine, and toxins existing in it, their effects on all body systems including nervous system, chemical reactions in the body, drug making methods with this herb in traditional medicine, and also poisoning treatment methods with this herb from viewpoints of both traditional and modern medicine in available documentations are fully investigated.

Effect of Atropa belladonna on the central nervous system

The Atropa belladonna alkaloids atropine and scopolamine are known to be antagonist for muscarinic receptors. They block the muscarinic receptor acetylcholine, which plays an important role in the functioning of the brain for learning, memory and orientation. In the event of the muscarinic blockade, the absence of acetylcholine causes dysfunctional memory, disorientation and hallucination. The respiratory rate increases and in some cases of overdose, leads to respiratory and cardiovascular failure.

Effect of Atropa belladonna on peripheral nervous system

The alkaloid atropine acts as muscarinic antagonist and blocks the parasympathetic postganglionic muscarinic receptors. Atropine has a stronger effect than scopolamine in producing tachycardia and cardiovascular changes, although the peripheral effects of both atropine and scopolamine are the same.

Results: The signs of peripheral effects manifested by the parasympathetic block include decreased secretions causing dryness of mouth, flushed skin, mydriasis, vomiting, constipation, urinary retention, fever, tachycardia and hypertension.

Keywords: Atropa Belladonna, Overview

Abstract No: 160

Does Naloxone Prevent Seizure in Tramadol Intoxicated Patients?

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Abstract

Background: Tramadol poisoning has increased in recent years. Seizure is one of the side-effects of tramadol toxicity. There is a controversy about possible preventive effect of naloxone in tramadol poisoning induced seizure. Therefore, this study was performed to compare seizure incidence in tramadol poisoning patients who received and did not receive naloxone, as an opioid antagonist.

Methods & Materials: This study involved prospective data collection followed by retrospective analysis on 104 tramadol poisoning patients who were admitted in a referral poisoning center. The incidences of seizure were compared between patients received naloxone and those did not. Outcome was considered as survived without or with complications and death. Logistic Regression analysis was used to determine the effects of different variables on seizure incidence.

Results: 70 (67.3%) of the patients were men. The mean age of the patients was 26.3 ± 9 years old. 18.3% of the patients received naloxone in their treatment period. Seizure incidence was significantly higher among tramadol poisoning patients who did not receive naloxone compare with those received naloxone (14.1% vs. 5.1%). Among different variable studied, age had a significant effect on predicting of seizure (odds ratio = 2.09; 95% of confidence interval: 1.82-2.26; P value, 0.004).

Conclusions: Although the seizure incidence was lower in patients with tramadol poisoning who received naloxone, the logistic regression did not support the preventive effect of naloxone on seizure in tramadol poisoning cases.

Keyword: Naloxone, poisoning, seizure, tramadol

Abstract No: 142

Effect of Intravenous Lipid Emulsion on Clozapine acute Toxicity in Rats

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Abstract

Background: Many new studies has been reported the effect of intravenous lipid emulsion (ILE) as an antidote on acute lipophilic drug toxicity. Clozapine, a highly lipophilic dibenzodiazepine neuroleptic, is one of the most effective medicines in the treatment of refractory schizophrenia and is increasingly being used to treat, affective disorders, some neurological disorders and aggression. We expected the ILE could be used in treatment of patient with clozapine acute toxicity.

Methods & Materials: We used two groups of consisting six male rats. Both groups received toxic dose of clozapine (40mg/kg) intravenously, via tail vein. After 15 minutes the first group received 18.6 mg/kg normal saline intravenously (NS group), the second group received 18.6 mg/kg ILE20% intravenously (ILE group). We evaluated blood pressure(BP), heart rate, by power lab apparatus through tail artery, ataxia by rat rotary circle, seizure scores and death on 0, 15, 30, 45, 60, 180, 360, 720 and 1440 minutes after starting clozapine administration. Blood and tissue samples were taken from all animals at 24 hours or at death time for biochemical, cell count, and pathological studies.

Results: ILE20% could restore hypotension-induced by clozapine better than normal saline (ILE: 101.153 ± 2.64 , NS: 89.694 ± 9.78 $PV < 0.05$ in 30 min) Furthermore ataxia (ILE: 13.167 ± 2.24 , NS: 0.000 ± 0.00 $PV < 0.0001$ in 3hours) and seizure have restore more rapidly and deaths reduced.

Clozapine administration induced pancatitis, but it was so severe in the normal saline group than in intralipid group.

Conclusion: In conclusion, ILE can remove toxic signs of clozapine same as other lipophylic medicines, however clinically uses of ILE for this purpose needs more evaluation to determine exact indication and safety.

Keyword: Clozapine, Intravenous Lipid Emulsion) ILE (, acute toxicity, rat

Abstract No: 137

Study drug addiction tramadol and diphenoxylate in Referred to the legal lab in 1393, Markazi Province

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Abstract

Background: Tramadol is a drug opioid-like analgesic for the relief of moderate to severe pain and chemically structured hydrochloride is used. Who are the main consumers of the drug tramadol as an alternative to drugs or leave it with the aim of reducing the effects of withdrawal drug use.

Methods & Materials: Of 315 Referred who were suspected of drug use Arak legal laboratories were referred from which samples were urine collected. And then extracted samples were then instrumental tests using GC / MS was performed on the samples.

Results: 315 of 163 people referred for testing in order of frequency of opium alkaloids morphine, methamphetamine-type drugs, drugs of diphenoxylate, tramadol, methadone pharmaceutical group of benzodiazepines and other drugs in the rest of the 152 positive result negative tests were reported

Conclusion: The results of this study suggest that dynamic opium and methamphetamine still in first place and second. But diphenoxylate third, and then Tramadol before methadone and benzodiazepines are. The tendency to benzodiazepines and diphenoxylate Since drugs and psychotropic substances can lead to social exclusion clients willing to use force rather diphenoxylate, Tramadol, benzodiazepines and methadone before the day of the test, because the consequences of the diagnosis and stimulant drugs methamphetamine fill them cost

Keywords: Tramadol, Diphenoxylat, addiction

Abstract No: 124

Outcome prediction in patients with Methamphetamine poisoning: a toxico-epidemiological approach

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Abstract

Background: Methamphetamine (METH) is the most widely abused drug worldwide. Since there is a difference with respect to epidemiology of poisoning in the geographic distribution, we performed a study on the METH poisoning in a referral clinical toxicology department in Iran considering outcome prediction.

Methods & Materials: This hospital based, analytical and descriptive study was carried out from 2012 to 2013 at referral clinical toxicology department. The inclusion criteria were all patients between 18 to 65 years of age admitted with diagnosis of METH poisoning. The information included gender, age, type and route of poisoning, clinical manifestations, duration of hospitalization, and outcome. ANOVA, chi-square and binary logistic regression were used for analysis.

Results: During one year of study, 129 patients including 111(86%) males and 18(14%) females had been hospitalized and evaluated. The mean (SD) age was 30.70 ± 0.93 . Most of the patients had intentional poisoning (93.7%). In 42.6%, inhalation was the main route of exposure. Six patients had skin and 25 (19.37%) patients had pulmonary manifestations.

Most of the patients had complete improvement without any complication (89.1%). Age (OR, 1.05; 95% CI 1.006-1.099), suicide history (OR 30.33; 95% CI 3.11-295.24), route of poisoning [(ingestion: OR, 0.21; 95%CI 0.05-0.87), (inhalation: OR, 0.19; 95% CI 0.04-0.78)] and pulmonary system manifestations (OR 1.84; 95% CI 1.15-2.93) were predictive in patients outcome ($P < 0.05$).

Conclusion: Methamphetamine poisoning was more common in males with intentional poisoning. Age, past history of suicide, route of poisoning and pulmonary manifestations on admission to hospital should be considered as important predictive factors in outcome patients.

Keywords: Methamphetamine, Outcome of therapy, Toxico-epidemiology

Abstract No: 497

Activity of Kurdish propolis on Leishmania major

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Abstract

Background: Propolis is a natural resinous mixture produced by honeybee from substances collected from part of plants, buds, and exudate which is used in folk medicine due to its several pharmacological properties. Its chemical composition varies according to the region where it is produced. Our aim in preparing this study was to evaluate the anti-leishmanial activity of Zagrosian propolis extract in vitro.

Methods & Materials: Treatment (Propolis-treated) groups, positive and negative controls (Meglumine Antimoniate and PBS respectively) were considered. The promastigotes were cultured in RPMI 1640+ 10% FBS media and the viability of the organisms was confirmed through direct observation of their movement under light microscope. In the treatment groups, the pre-cultured promastigotes were treated with the Zagrosian propolis extract and changes in viability of the organisms were evaluated by MTT assay.

Results: Our results showed that the number of viable promastigotes were significantly decreased after treatment with the propolis extract ($P < 0.05$) in a dose-independent manner, indicating that the plant possesses a beneficial cytotoxic effect on Leishmania major, in vitro. To the authors knowledge, this is the first report of using Zagrosian propolis extract on Leishmania major strain (MRHO/IR/75/AR).

Keywords: Leishmania major - natural products - Kurdish propolis

Abstract No: 562

Acute amphetamine overdose in Loghman Hakim Hospital Poison Center: Clinical and paraclinical

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Abstract

Background: Amphetamines are subgroups of stimulants that are structurally related to epinephrine, norepinephrine, and dopamine neurotransmitters. As this substance abuse is unfortunately spreading all over the world and in our community especially between young people, this seems mandatory to know clinical, paraclinical presentations and other toxicological issues well.

Methods & Materials: This analytic cross-sectional study was done retrospectively on the file of all pure amphetamine toxicity cases in Loghman Hakim Hospital Poison Center between 2011 and 2013. Any multi substance or other drug overdose was deleted from our list. The factors that we focused on were sex, age, clinical and laboratory findings, duration of hospital, and outcome. All the data were analyzed by SPSS software version 16.

Results: 226 patients were enrolled in the study. The mean age was 32.7 ± 11 years old. Most of the patients (77%) were male. The most common amphetamine derivatives were crystal (96.9%). The most common route of exposure was oral ingestion. Agitation (72%), and confusion (24%) were the most common clinical manifestations. Coma was observed in 5.4% of cases. Seizure happened in 12 patients. The median systolic and diastolic blood pressure was 125 and 78 mmHg, respectively. Five patients had QRS widening. In four cases, ST segment changes were observed, and ventricular dysrhythmias happened in three patients. The average number of creatine phosphokinase (CPK) and lactate dehydrogenase was 1067 and 909. Twenty-four patients were intubated. The average time of hospitalization was 2.8 days with a mortality rate of 5.3%. Complications recorded in 15 patients (6.6%) that include rhabdomyolysis, Adult Respiratory Distress Syndrome, pneumonia, and deep vein thrombosis.

Conclusion: In our study, male patients were 3 times of women that is a high rate. Twenty-five percent of patients had suicidal attempt with amphetamine derivatives that should be considered

from psychological aspect. Cardiologic disorder (tachycardia) and behavioral abnormality were most common physical and mental disorder. With regard to high rate of methamphetamine abuse in young patients, social network should be considered for preventing of this substance abuse and substantially toxicity due to it.

Keywords: Amphetamine, drug, abuse

Abstract No: 479

In vitro antileishmanial effect of Aloe vera leaf exudate

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Abstract

Background: Aloe vera is a medicinal plant with a vast variety of beneficial therapeutic properties which has been long used in the traditional medicine of different cultures. It has a widespread use in health products and despite several reports on the whole plant and inner gel, little work has been performed on the leaf exudate. Our aim in preparing this study was to evaluate the anti-leishmanial activity of Aloe vera leaf exudate in vitro.

Methods & Materials: Treatment (Aloe vera-treated) groups, positive and negative controls (Meglumine Antimoniate and PBS respectively) were considered. The promastigotes were cultured in RPMI 1640 + 10% FBS media and the viability of the organisms was confirmed through direct observation of their movement under light microscope.

Results: In the treatment groups, the pre-cultured promastigotes were treated with the Aloe vera leaf exudate and changes in viability of the organisms were evaluated by MTT assay. Our results showed that the number of viable promastigotes were significantly decreased after treatment with the plant exudate ($P < 0.05$) in a dose-independent manner, indicating that the plant possesses a beneficial cytotoxic effect on *Leishmania major*, in vitro. To the authors knowledge, this is the first report of using aloe vera on *Leishmania major* strain (MRHO/IR/75/AR).

Conclusion: Since most of the studies conducted on the anti-leishmanial activity of Aloe vera thus far, have been carried out on the visceral models, the present study revealed a new effect of the plant to be employed for therapeutic purposes.

Keywords: Aloe vera, *Leishmania major*, promastigotes , Meglumine Antimoniate , MTT assay

Abstract No: 490

Anticancer and iron chelating activity of Pistachia hull extract

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Abstract

Background: In recent years, the potential for iron chelators in the treatment of cancer has emerged. This show the fact that cancer cells typically require more iron than normal cells to mediate their generally rapid DNA synthesis and growth, Therefore, divesting cancer cells of iron is a novel approach for cancer therapy. Pistachia vera L., is a plant member of Anacardiaceae family and native to Asia. Pistachio nut is mostly produced in Iran and some other countries. Studies on different part of this plant such as leaves, Kernels, hulls and gum demonstrate various biological activities such as antioxidant potential, antimicrobial, anti-inflammatory, mainly due to flavonoids and other phenolic components and anti-insect activities. In this study, iron chelating activity of pistachio hull extract is determinated and it tested for cytotoxic activity against A549, human breast cancer cell line.

Methods & Materials: The pistachio hull extract was effective in chelation of iron ions. Moreover, we have also studied that the crude extract inhibited A549 human breast cancer cell viability in a dose-dependent manner; the poor toxicity (27%) at 10 µg/ml to moderate toxicity (63%) at 100 µg/ml. The IC50 values calculated were 71µg/ml.

Results: Our result display that pistachio hull extract has cytotoxicity effects, and could be an alternate candidate for the development of novel biologically active compounds.

Keywords: Pistachia hull, iron chelating, anti-cancer, breast cancer

Abstract No: 492

Analysis of herbal medicines for addiction treatment sold by GC-MS and HPLC in Zanzan groceries

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Abstract

Background: Drug abuse affected life of many peoples. Because this, There is particular sensitivity in treatment. Over the past few years production and distribution of rehab herbal medicines done by herb sellers. The purpose of this study was collection rehab herbal drugs and investigation pharmaceutical components in their.

Methods & Materials: This study performed in laboratory of Zanzan Legal Medicine in 2014. Drugs detected by GC/MS and HPLC instruments and collected data analyzed by SPSS.

Results: 143 samples collected from Zanzancity groceries. 22.4% of samples didn't have any drug components and 77.6% of samples had at least one compound's. Mean of drugs weights was 1.07 gr with SD=0.64 capsule and tablet shape with cumulative percent =98.6% had more frequency. Tramadol in 100 Samples, Atropine and Diphenoxylate in 45 samples, Bipiridine in 2 samples, Venlafaxine in 6 samples, Cyproheptadine in 6 samples, Caffeine in 2 samples, Phenadoxone in 1 sample detected. Carvacrol, Tymol, Miricystine were the main impurity

Conclusion: The study found that most of the drugs that are offered as a herbal drug for medicinal herbs sellers containing a variety of chemical and synthetic drugs. Use of Diphenoxylate, tramadol and another drugs without prescription cause not to leave and the symptomatic treatment of withdrawal symptoms reduce symptoms and induce rehab. Consistency use of this drugs causes other drug addiction.

Keyword: Grocery, Drug abuse, herbal, HPLC, GC-MS

Abstract No: 564

HEPATOPROTECTIVE ACTIVITY OF CAPPARIS SPINOSA FRUIT EXTRACT AGAINST CCl₄-INDUCED TOXICITY IN RATS

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Abstract

Background: Capparis spinosa (CS), a member of Capparidaceae, is one of the most usual fragrant plants grown in dried regions of west or central Asia including Iran, and Mediterranean area. From centuries ago, CS aeral parts have been used in traditional medicine for different means, and it is currently used in polyherbal formulations for treatment of liver disorders. CS contains some antioxidants such as flavonoids and other polyphenols which play a great role in many pharmacological activities.

Methods & Materials: In this study, the hepatoprotective activity of CS fruit ethanolic extract (CSE) against CCl₄-induced hepatic damage in rats was evaluated. Administration 1.5 ml/kg CCl₄ (i.p.) to rats decreased the GSH content of liver from 30.1±0.9 mcg/g to about 11.7±0.7 mcg/g, and increased TBARS from 0.7±0.1 to 4.4±0.75 ng/mg tissue. It also increased serum liver marker enzymes ALT, AST and LDH, 62, 26, and 5.5 folds, respectively.

Results: Severe histopathological damage including fatty changes, necrosis ballooning degeneration and broad lymphocytes and kupffer cells infiltration were evident. Rats received CSE as pre- and post-treatment with 100 or 200 mg/kg by oral rout. Post-treatment with 200 mg/kg CSE for 2 days after administration of CCl₄ completely prevented histopathological damages and returned serum ALT, AST, and LDH to about normal values. It also restored GSH and TBARS levels to 26.5±0.1 mcg/ml and 0.9±0.1 ng/ml, respectively. Post-treatment with 100 mg/kg CSE or pretreatment with 200 mg/kg CSE also significantly prevented CCl₄-induced damages to the liver but not as effective as 200 mg/kg post-treatment, but pre-treatment with 100 mg/kg CSE did not show any significant protective effect. Therefore, administration of CSE extract may be effective for treatment of oxidative liver damages.

Conclusion: Lack of effect of CSE as pretreatment may be due to rapid metabolism of antioxidant content of CSE.

Keywords: Hepatotoxicity; CCl₄; Capparis spinosa; Liver enzymes; Histopathology

Abstract No: 563

Determination of the Mutagenicity Potential of Sankol Herbal Medicine by Single Cell Gel Electrophoresis in Rat Hepatocytes in Comparison With H₂O₂

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Abstract

Background: The increasing use of herbal drugs and their ease of accessibility and availability have necessitated the use of mutagenicity test to analyze their toxicity and safety. This study aimed to evaluate the genotoxicity of Sankol herbal medicine in DNA breakage of rat hepatocytes in comparison with H₂O₂ by single cell gel electrophoresis technique or comet assay.

Method & Materials: In the current study hepatocytes were prepared from male wistar rats. Hepatocytes cells were counted and kept in a bioreactor for 30 minutes, then cells were exposed to Sankol herbal medicine at doses of 100, 200 and 400 µl/ml. Buffer 4 (incubation buffer) and H₂O₂ were used for one hour as negative and positive control respectively. After 30 minutes cell suspension with low melting point agarose was put on precoated slides and covered with agarose gel. Then lysing, electrophoresis, neutralization and staining were carried out. Finally the slides were analyzed by fluorescence microscope. The parameter under this analysis was the type of migration which was determined according to Kobayashi pattern.

Results: Results of the study indicated that by increasing the dose of Sankol herbal medicine, the DNA damage slightly increased ($P < 0001$).

Conclusions: In overall compared to the positive control, significant differences were observed which indicated that the crude extract of Sankol in vitro did not have mutagenic effect.

Keywords: Toxicity Tests, Comet Assay, Herbal Medicine

Abstract No: 9

The comparative assessment of Antioxidant Capacity and Anti-Inflammatory effect and flavonoids of Iranian and imported black tea with Green tea

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Abstract

Background: In the last years, has been growing interest in using foods for treatment and prevention of disease. The antioxidant, anti-inflammatory activity and total flavonoids of Iranian black tea, imported black tea with green tea were surveyed.

Methods & Materials: In this study, the antioxidant activity was surveyed by applying cupric ion reducing assay (cupric assay) at 450 nm and anti-inflammatory activity by inhibition albumin serum denaturation at 660 nm, and total flavonoids by approved methods.

Results: The antioxidant capacity and total flavonoids of Iranian black tea were 0.231 ± 0.03 and 0.0242 ± 0.0005 respectively. These amounts were more than green tea and imported black tea. The anti-inflammatory activity of green tea was considerable; 0.01 ± 0.001 . But in this regard the level of Iranian black tea more than imported black tea.

Conclusion: In this study, the nutrition values of Iranian black tea compared to imported black tea were significantly diagnosed.

Keywords: Antioxidant capacity, Anti-inflammatory effects, Total flavonoids, of Iranian and imported black tea, green tea

Abstract No: 547

Neroprotective activity of six medicinal plants from Iran against K⁺ Deprivation-Induced Apoptosis in cultured Primary Cerebellar Granule Neurons

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Abstract

Background: Apoptosis is a type of programmed cell death involved in pathological conditions in the nervous system, including neurodegenerative diseases such as Alzheimer's disease. Compounds with antiapoptotic property might have therapeutic effects for these diseases. Deprivation of potassium in cultured cerebellar granule neurons (CGNs) induces apoptosis and this model is used for studying mechanism of neural cell apoptosis or protective effect of the test compound. In the present study protective effect of six medicinal plants from Iran including *Sanguisorba minor*, *Cerasus microcarpa*, *Ferulago angulate*, *Stachys pilifera*, *Amygdalus scoparia*, and *Rosa canina* is investigated in this model.

Methods & Materials: CGNs were taken from male mice at postnatal day6-7 and cultured in cell culture medium contains 10% FBS and 25 mM KCl. After seven days in vitro (DIV 7) the medium was replaced by serum free medium contains 5 mM KCl (K⁺ Deprivation) or 5 mM KCl with extracts .Cell viability was measured by MTT assay after 48 h.

Results: Among the extracts tested only *Stachys pilifera* showed protective activity and dose dependently attenuated K⁺ deprivation-Induced cell death.

Conclusion: According to this finding it is suggested that *has neuroprotective activity through antiapoptotic activity and it is recommended further investigation about this medicinal plant as treatment for neuronal injury.

Keywords: Apoptosis, Medicinal plants, Cerebellar Granule Neurons

Abstract No: 534

Determination of Cd, Pb, Ni in Glycyrrhiza glabra purchased from herbal medicine shops in Kerman by atomic absorption spectrophotometry

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Abstract

Background: Medicinal herbs have had very important roles in therapeutics or as dietary supplements for many thousands of years, especially in recent decades. Nowadays safety issues have been considered regarding the use of herbs due to the reports of illness and fatalities. Toxicities take place by heavy metals in medicinal plants were reported around the world. Herbs can contain toxic metals from their presence in the soil (including contamination of the plant material with soil), water or air. In the traditional system of medicine, the roots and rhizomes of *Glycyrrhiza glabra* have been employed clinically for centuries for their anti-inflammatory, antiulcer, expectorant, antimicrobial and anxiolytic activities.

Methods & Materials: In this study, because of widespread use of liquorice and potential hazards of its contamination with toxic metals, Cd, Pb, and Ni were determined in both the raw roots and aqueous extract of *Glycyrrhiza glabra*. Roots of licorice from various origin were purchased from local market in Kerman, were washed thoroughly with water and dried at room temperature and grounded into coarse powder for extract preparation. The plant material was authenticated from pharmacognosy department of pharmacy faculty, Kerman. The powdered root material was extracted with distilled water by maceration, filtered using filter paper and extract was vacuum evaporated at 40°C. In addition the residue on ignition was prepared by placing the powdered sample in oven at 500°C for about two hours and then the residue was reconstituted in the acid media. Cd, Pb and Ni were measured by atomic spectrophotometry.

Results: Results showed that Cd, Pb and Ni in both raw powdered sample and extract were detectable in the range of the calibration curve of the analytical method. The risk of toxicity with heavy metals contained in *Glycyrrhiza glabra* root were calculated using estimated maximum weekly intake of Cd, Pb and Ni after consumption of the maximum recommended therapeutic dose.

Keywords: Cd; Pb; Ni; *Glycyrrhiza glabra*

Abstract No: 105

Haliclona oculata: Novel Anticancer Sponge Acting on Liver Cancer Cell Mitochondria

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Abstract

Background: Sponges are important components of the Persian Gulf animal communities and marine sponges of the genus *Haliclona* have been known to display broad spectrum biological activities. Sponges can provide potential drugs against many major world-wide occurring diseases. Hepatocellular carcinoma (HCC) is the most common type of liver cancer.

Materials & Methods: In the present investigation, diethyl nitrosamine (DEN) (200 mg/kg body weight i.p) was used as a liver carcinogen to induce HCC in experimental animals, and then cancer promoted by 2-acetylaminofluorene (2-AAF) (0.02 w/w) for two week. Liver mitochondria (cancerous and non-cancerous) were obtained using differential centrifugation from wistar rats and mitochondrial reactive oxygen species (ROS) production, collapse of mitochondrial membrane potential (MMP) and mitochondrial swelling was examined by fluorescence spectrometer following the addition of *Haliclona oculata*.

Results: Single injection of DEN (200 mg/kg, i.p.) and 2-AAF caused a significant increase in serum AFP, ALT, AST and ALP levels in comparison with normal group. On the other hand, our in vitro results with ONLY cancerous BUT NOT normal non-cancerous group mitochondria revealed significant ($P < 0.05$) increase in mitochondrial ROS formation, MMP collapse, and mitochondrial swelling and cytochrome c release after addition of different concentrations of *Haliclona oculata*.

Conclusion: These results showed that *Haliclona oculata* total methanolic extract has a selective toxicity on liver cancer cell mitochondria and hence may be helpful in the treatment of HCC.

Keyword: Sponge, *Haliclona oculata*, Mitochondria, Hepatocellular carcinoma

Abstract No: 98

The anticancer effects of methanol extract of Capparis Spinosa

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Abstract

Background: Traditionally, caper (Capparis Spinosa) have long been used for its analgesic, anti-inflammatory, anti-oxidant, anti-diabetic and anti-cancer properties. In the present study, the anti-cancer effect of methanolic extract of caper collected from two different region of Iran were studied mechanistically in HT29 cell line.

Materials & Methods: IC₅₀ for extract was determined by MTT assay and subsequent effects on the levels of ROS, apoptosis and mitochondrial membrane potential changes were evaluated.

Results & Conclusion: Our results showed that the caper extract induced massive cell death in HT29 cells that could be ensued by reducing the membrane potential of mitochondria and elevation of ROS generation followed by activation of intrinsic pathway for programmed cell death.

Keyword: Capparis Spinosa, ROS, apoptosis, mitochondrial membrane potential

Abstract No: 555

In –vitro reducing ability measurement of herbal infusions made from green tea and lemon verbena

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Abstract

Background: Cammellia sinensis L. (Green Tea; Teaceae) and Lippia citriodora (Lemon Verbena; Verbenaceae) are plants which have potential for curing some chronic and inflammatory diseases. Due to rich phenolic compounds present in two herbs, both of them might be able to remove free radicals in biologic and food systems; however their antioxidant powers can be different. This study was aimed to evaluate and assay the reducing ability power of two infusions made from green tea (GT) and lemon verbena (LV) and in our before studies showed to have remarkable phenolic compounds.

Methods & Materials: GT herb was provided by local vender placed in Lahijan city. LV samples obtained from research field of IHEC. A % 5 solution (W/V) was made for both GT and LV and infusion times of 18 and 30 minutes were exerted on GT and LV, respectively. The reducing power of both infusion were assayed spectrophotometrically at wavelength of 700 nm by a method described by Yen and Chen (1995) using phosphate buffer (pH 6.6) and 1% potassium ferricyanide and also by adding trichloroacetic acid (TCA, 10 %).

Results: Our results showed that GT at 4000 µg/ml concentration has the most reducing activity based on absorbance (1.27 ± 0.19 Abs) whilst for LV the most reducing activity was obtained at the concentration 5000 µg/ml which was equaled to (1.42 ± 0.11 Abs Abs). Both infusions showed concentration dependant reducing power with a concentration range from 0.05 to 5000 µg/ml. The reducing ability of both of infusions was lesser than Vitamin C`s value which was equaled to 0.39 ± 0.02 Abs at 5 µg/ml concentration.

Conclusion: it can be concluded that green tea has stronger reducing power and more efficient when compared to lemon verbena and it might be able to denote electron to reactive radicals which can be driven from poisons formed in living systems.

Keywords: Reducing power, green tea, lemon verbena

Abstract No: 56

Hypoglycemic Effect of Citrullus colocynthis Pulp Extract in Doxorubicin-exposed Male Mice

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Abstract

Background: Long-term clinical usefulness of doxorubicin (DOX), a world recognized chemotherapeutic agent, is limited by serious toxicity to non-target tissues. The aim of this study was to show whether Citrullus colocynthis pulp hydroalcoholic extract (CCE) could serve as a protective agent against DOX-related pancreatic toxicity in a mouse model.

Methods & Materials: Adult male mice were divided into four groups (n=6 per group). DOX was administered to two groups of mice in 6 equal intraperitoneal injections over a period of 5 weeks (accumulated dose of 9 mg/kg). One of these groups received CCE at a dose of 200 mg/kg intraperitoneally four hours after DOX treatment. Vehicle-treated control group and CCE-only treated group were also included.

Results & Conclusion: Elevated levels of serum glucose were observed in DOX-treated animals, indicating DOX-induced pancreatic toxicity. The supplementation of the CCE along with DOX caused normalised level of blood glucose. This study revealed that CCE possesses potent hypoglycemic action in DOX-treated mice. Clinical studies are preferable to scrutinize the efficacy of CCE for the prevention of DOX-induced organopathies.

Keywords: Citrullus colocynthis, Doxorubicin, Glucose, Mouse

Abstract No: 372

Study of Intraperitoneal Median Lethal Dose of Methanolic Extract of *Sclerorhachis platyrachis* in Rats

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Abstract

Background: Herbal treatment is very common around the world. The use of medicinal plants has increased due to chemical drugs. Identification of medicinal plants in natural habitats and their companion species as the first step and evaluation of their properties as the second step have long been indicated in increasing the health community up to now. Two species of the genus *sclerorhachis* of the *compositae* family are endemic to Iran; *S. platyrachis* and *S. leptoclada*. Both species are widely distributed throughout Khorasan province, North Eastern Iran. There are no reports regarding the toxicity of methanolic extract of *S. platyrachis*.

Materials & Methods: The present study was carried out to determine LD50 of methanolic extract of *S. platyrachis* in rats by intraperitoneal injection. Autopsy and histopathology of liver was also determined.

Results: The LD50 in Rat after intraperitoneal injection not determined.

Conclusion: methanolic extract of *S. platyrachis* is a safe extract, particularly when intraperitoneal injection to experimental animals.

Keywords: *Sclerorhachis platyrachis*, LD50, intraperitoneal, rats

Abstract No: 21

Effects of *Eugenia caryophyllus* and *Origanum compactum* Essential Oils on the Growth of *Staphylococcus aureus* ATCC 29213 and Gene Expression of Enterotoxins A, C and E

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Abstract

Background: *Staphylococcus aureus* is a bacterial pathogen involved in a wide range of diseases varying from infections to toxemia. Staphylococcal food-poisoning is caused by the ingestion of staphylococcal enterotoxins (SEs). This study was conducted to determine the effects of *Eugenia caryophyllus* (clove) and *Origanum compactum* (oregano) essential oils (EOs) on the growth of *S. aureus* ATCC 29213 and the expression of the SEA, SEC and SEE genes.

Materials & Methods: The minimum inhibitory concentrations (MIC) of clove and oregano oils were 0.2 and 0.1%, respectively. Colony counts at 24, 48 and 72h of cultures grown in the presence of 75% MIC of clove oil showed that the growth rate was reduced 1.46, 1.67 and 1.83 log₁₀ cfu/ml compared to the control, and in the case of oregano at 75% MIC the decreases in growth rate were 2.16, 2.25 and 2.68 log₁₀ cfu/ml, respectively.

Results: When cultured with EOs present at 75% MIC, the transcript levels of sea, sec, see and the regulatory gene (agrA) were decreased 8.81, 9.13, 9.08 and 8.32 fold in the case of clove, and 11.56, 9.96, 11.07 and 11.15 fold in the case of oregano, compared to the control. The amounts of enterotoxin secreted by *S. aureus* were also seen to decrease significantly.

Keywords: *Eugenia caryophyllus*, *Origanum compactum*, *Staphylococcus aureus*, Enterotoxin, Gene Expression

Abstract No: 22

Effects of *Zataria multiflora* Boiss. Essential oil on growth and gene expression of enterotoxins A, C and E in *Staphylococcus aureus* ATCC 29213

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Abstract

Background: Staphylococcal food poisoning results from the consumption of food in which enterotoxigenic staphylococci have grown and produced toxins. The present study was conducted with three principal aims: i) to determine the minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) of *Zataria multiflora* Boiss. essential oil (EO) against *Staphylococcus aureus* ATCC 29213, ii) to evaluate the effect of subinhibitory concentrations (subMIC) of EO on the growth of bacteria over 72 h (at 25 and 35 °C), and iii) to investigate the expression of genes involved in the production of staphylococcal enterotoxins SEA, SEC and SEE over 72 h at 35 °C.

Methods & Materials: The MIC and MBC of *Z. multiflora* Boiss. EO were 0.03 and 0.04%, respectively. Colony counting at 24, 48 and 72 h of 3 day cultures grown in the presence of 75% MIC of the EO showed that the growth rate was reduced 2.16, 2.78 and 2.91 log₁₀ cfu/ml at 25 °C, and 1.34, 2.35 and 2.57 log₁₀ cfu/ml at 35 °C, respectively, compared to control cultures.

Results: SubMIC levels of EO also significantly decreased the expression of staphylococcal enterotoxin (SE)-related genes and therefore the production of SEs in a dose dependent manner. For example, when cultured with 75% MIC, the transcriptional levels of sea, sec, see and agrA were decreased 11.7, 9.3, 10.45 and 10.3 fold after 18 h and 13.9, 11.21, 12.44 and 12.52 fold after 72 h in comparison to control, respectively.

Keywords: *Zataria multiflora* , *Staphylococcus aureus*, Enterotoxin, Gene Expression

Abstract No: 12

Substance abuse and aspiration pneumonia

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Abstract

Background: According to the CDC in 2008 total deaths from poisoning surpassed traffic accidents during the past 30 years has been unprecedented .An important cause of pneumonia is aspiration and mortality rates of 60-30% have been reported in patients with aspiration of gastric contents. In our beloved country (Iran) the most poisoning death (50 to 60 percent of deaths per year) was due to toxicity of substance abuse.

Methods: 4750 patients admitted to the Noor & Ali Asghar hospital within one year of study and were isolated from patients with aspiration pneumonia and 79 patients were sampled; after extracting information from the questionnaires, the data were analyzed using SPSS version 19.

Results: Among patients with aspiration pneumonia were: 41% substance abuse, 10.8% drug poisoning, 11.5% detergents and pesticides, and 15.4% mixture of materials had used and 1.3% of cases of poisoning were unknown.

Conclusion: With special attention to the prevention and treatment of substance abuse and motivate people to leave the material these problems can occur and avoid the costs of treatment and Waste national resources.

Keywords: substance abuse, aspiration, pneumonia, poisoning

Abstract No: 341

The Effects of hydro-alcoholic extract of *Achillea millefolium* on apoptotic changes in Cyclophosphamide Treated Mice

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Abstract

Background: Cyclophosphamide (CP) is extensively used as an antineoplastic agent for treatment of various cancers, as well as that is known to cause several adverse effects including cell toxicity. *Achillea millefolium* (AM) is one of the oldest medicinal plant has been shown to be cytoprotective by scavenging free radicals. The present study was aimed to evaluate the effects of hydro-alcoholic extract of AM inflorescences in 3 different doses on apoptotic changes in CP

Materials & Method: Treated Mice using Annexin V-binding method for the detection of membrane phosphatidylserine translocation. In order to 30 Male adult NMRI mice, aged 6-8 weeks, were randomly divided into five groups and treated for 35 days. The control group received distilled water (0.1 ml/kg, daily), Group 2 received CP alone (5mg in 50ml distilled water /kg, daily), Group 3 received CP (5mg in 50ml distilled water /kg, daily) + hydro-alcoholic extract of AM (75mg/kg, daily). Group 4 received CP (5mg in 50ml distilled water /kg, daily) + hydro-alcoholic extract of AM (150mg/kg, daily) and Group 5 received CP (5mg in 50ml distilled water /kg, daily) + hydro-alcoholic extract of AM (300mg/kg, daily). Statistical analyses were performed using ANOVA and Tukey test.

Result: CP significantly increased apoptosis in comparison with that of control group. Higher rate of Annexin V-positive (ANV+) cells was observed in group 2 ($p < 0.001$) and 5 ($p < 0.05$) compared to group 1. Above-mentioned parameter in group 4 significantly decreased compared to group 2 ($p < 0.05$).

Conclusion: However, Medium dose AM (150mg/kg) has protective effect on apoptosis in mice under treatment with chemotherapy. But High dose of AM (300mg/kg) caused increase cell toxicity of CP.

This study was financially supported by Urmia University and the corresponding author has been authorized to submit it

Keywords: *Achillea millefolium*, apoptotic changes, Cyclophosphamide, Annexin V, Cell toxicity

Abstract No: 250

In vivo evaluation of *Scrophularia oxysepala* effects on hepatotoxicity induced by dimethylhydrazine: a carcinogenic agent

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Abstract

Background: *Scrophularia oxysepala* is naturally occurring annual plant. Used traditionally for wound healing, immunomodulator, antibacterial and as an antioxidant agent. In this study we attempted to evaluate in vivo inhibitory effects of *Scrophularia oxysepala* on hepatotoxicity induced by dimethylhydrazine.

Materials & Methods: Male Albino Wistar rats were divided into V groups (each group 12 animals). As a control, Group I received normal saline. In all other groups the hepatotoxicity was achieved by injection of dimethylhydrazine (40 mg/kg) subcutaneously (2 injection/week for two weeks). Group II was served as positive control. The groups III, IV and V were received orally methanolic extract of *Scrophularia oxysepala*, dose dependently (50, 100 and 200 mg/kg/day/two weeks). 12 hours after last dose, all groups of animals were killed and the liver tissue samples were collected. Then the microscopic sections were prepared and processed for histopathologic examinations. Also groups of animals treated with *Scrophularia oxysepala* alone did not develop any hepatic injuries during experimental observation and thereby, those data are not shown in this study.

Results: In comparison to control group, there were significantly ($P < 0.05$) higher hepatic damage observed among those animals received dimethylhydrazine (congestion, hemorrhage, necrosis and bile duct proliferation). However, the *Scrophularia oxysepala* treated groups significantly showed attenuated hepatic damage.

Conclusion: The results obtained from this study showed that, active ingredients in *Scrophularia oxysepala* play an important role in abrogating hepatic injury. Also we suggest that *Scrophularia oxysepala* may be an effective herbal medicine and may offer protection against hepatic injury.

Keywords: *Scrophularia oxysepala*, Dimethylhydrazine, Hepatic injury

Abstract No: 330

Investigation on the Timing of Chemical Control of Lentil weevil, *Bruchus lentis* Frölich (Coleoptera: Chrysomelidae: Bruchinae) in Lentil Field in Gachsaran Region

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Abstract

Background: The lentil weevil, *Bruchus lentis* Frölich, (Coleoptera: Chrysomelidae: Bruchinae) is the most serious pest of lentil in Iran. Economic losses due to this pest have been estimated to reach up to 40% of the lentil crop. Over a two-year study (2012 and 2013) in Agricultural Research Station of Gachsaran, best timing of chemical control of *B. lentis* was determined.

Materials & Methods: A field experiment with cultivation of lentil (*Lens culinaris* Medik), Sina variety was conducted in a randomized complete block design (RCBD) with five treatments and three replications. The treatments consisted of spraying four times, respectively, during the early flowering, 10 days after the first spraying, 10 days after the second spraying; 10 days after the third spraying and control (without spraying). For the spraying from Endosulfan (Thiodan®) insecticide EC50% at ratio one liter per hectare was used. Three samples were taken from the pods and totally 150 pods from each replicate for contaminations of seeds were investigated. After the determination of the percent of seeds contamination, results were statistically analyzed.

Results: Based on the results obtained, first spray treatment, with the mean contamination of 15.45% and second spray treatment with the mean contamination of 12.25% had the highest impact on reducing contamination lentil seeds to *B. lentis* and between them there was no statistically significant difference and were in one group. Therefore, spraying one time during the early flowering until 15 days after it was the best time to control of *B. lentis*.

Keywords: Chemical control, Lentil Seed Beetle, Gachsaran, IPM.

Abstract No: 331

Investigation on the Timing of Chemical Control of Lentil weevil, *Bruchus lentis* Frölich (Coleoptera: Chrysomelidae: Bruchinae) in Lentil Field in Gachsaran Region

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Abstract

Safflower capsule fly, *Acanthiophilus helianthi* Rossi (Diptera: Tephritidae), is a key pest of safflower in Iran. The toxicity of Methidathion, Malathion, Deltamethrin and Lufenuron to adult males and females of *Acanthiophilus helianthi* was studied under laboratory conditions. Malathion was the most toxic among the tested compounds followed by Methidathion, Lufenuron and Deltamethrin to *Acanthiophilus helianthi* at 24 h post treatment, the respective LC₅₀ values were 0.40 ppm, 0.68 ppm, 10.99 ppm, and 11.75 ppm for males and 0.46 ppm, 0.97 ppm, 13.45 ppm, and 16.32 ppm for females. At 48 h post treatment Malathion was the most toxic followed by Methidathion, Deltamethrin and Lufenuron to *Acanthiophilus helianthi*, LC₅₀ values were 0.08 ppm, 0.54 ppm, 1.80 ppm, and 1.96 ppm for males and 0.34 ppm, 0.64 ppm, 1.88 ppm and 2.37 ppm for females. At 72 h post treatment Malathion was the most toxic followed by Methidathion, Lufenuron and Deltamethrin to *Acanthiophilus helianthi* LC₅₀ values were 0.04 ppm, 0.33 ppm, 0.44 ppm and 0.71 ppm for males and 0.09 ppm, 0.36 ppm, 0.75 ppm and 0.82 ppm for females. It is observed that LC₅₀ values for treated adult females increased more than in the treated adult males at 24 h, 48 h, and 72 h post treatment. It means that the adult males were more susceptible to the tested insecticides than the adult females.

Keyword: Safflower; Methidathion; Deltamethrin; Lufenuron; Malathion; Tephritidae; Safflower capsule fly, *Acanthiophilus helianthi*

Abstract No: 304

Evaluation of The effects of *Zingiber officinale*, *Rosmarinus officinalis*, *Peganum harmala* and mixture of them in D-galactose-induced aging in male mice

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Abstract

Background: Studies have proven anti-oxidants and herbs containing anti-oxidants can limit the amount of free radical products and effects of oxidative stress that is involved in aging. In the current study, we evaluated the effects of three herbs including *Zingiber officinale*, *Rosmarinus officinalis*, *Peganum harmala* and mixture of them in D-galactose-induced aging in male mice.

Materials & Methods: In this study the male BALB/c mice were put on 6-week D-galactose diet (500 mg/kg) to become biochemically and pathologically aged. At the beginning of the third week animals were randomly divided into 7 groups include the herbal medications (*Zingiber officinale* 250 mg/kg, *Rosmarinus officinalis* 250 mg/kg, *Peganum harmala* 250 mg/kg and mixture of them 750 mg/kg) and Vitamin E (200 mg/kg/day) as positive control. In addition the groups received 500 mg/kg D-galactose per 1 ml drinking water plus the herbs. Blood samples were obtained from subjects at the beginning of the third week and at the end of the study, and the parameters including tumor necrosis factor- α (TNF- α), interleukine-1 β (IL- β), interleukine-6 (IL-6), NF-kappaB (NF- κ b), total antioxidant power (TAP), lipid peroxides (LPO) and male sex hormones i.e. testosterone and dehydroepiandrosterone-sulfate (DHEA-S) were determined in the blood. The 7th group was sham and not given D-galactose.

Keywords: Aging, oxidative stress, herbal, mouse, D-galactose, Free radical, Anti aging

Abstract No: 278

Neuroprotective activity of seven medicinal plants from Iran against β -amyloid induced toxicity in PC12 cell.

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Abstract

Background: Alzheimer's disease (AD) is a neurodegenerative disease that was characterized with deposit of beta amyloid ($A\beta$) aggregate in senile plaque. Oxidative damage to neurons and loss of cholinergic neurons in forebrain region are observed in this disease. The drugs currently available to treat the AD are antioxidant and cholinesterase inhibitors which have limited effectiveness. Medicinal Plants are the valuable source of phytochemical agents and give templates to develop synthetic or semi-synthetic drugs. Galantamine, Rivastigmine and Huperazine are medicines with herbal origin used for the treatment of AD. In the present study protective effect of seven medicinal plants from Iran includes *Sanguisorba minor*, *Cerasus microcarpa*, *Ferulago angulate*, *Stachys pilifera*, *Amygdalus scoparia*, *Alhagi pseudalhagi* and *Rosa canina* against β -amyloid induced toxicity in PC12 cell were studied. Our previous study has been shown that methanolic extract of this plants have anticholinesterase activity.

Materials & Method: The plants were extracted with methanol by percolation at room temperature. PC12 cells were incubated with different concentration of extracts and aggregated $A\beta$ peptid (0.1, 0.5 μ M) in cultured medium for 24 h and cell viability was assessed by MTT assay.

Results: Among the extracts that were assessed, *Sanguisorba minor*, *Cerasus microcarpa*, *Ferulago angulate* and *Rosa canina* extract significantly ameliorated $A\beta$ induced toxicity and the protective effect of extracts was concentration dependent. The extracts had higher protective effect against low concentration of $A\beta$ (0.1 μ M) than high concentration (0.5 μ M).

Conclusion: This protective effect of extract may be attributed to antioxidant and anticholinesterase activity of them but it needs further investigation for finding exact mechanism. Based on neuroprotective effect of these plants against $A\beta$ induced toxicity, we recommend greater attention to their use in the treatment of Alzheimer disease.

Keywords: Beta amyloid, Neuroprotection, medicinal plant, PC12

Abstract No: 270

Evaluation of possible therapeutic effect of thymoquinone on paraquat-induced pulmonary fibrosis

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Abstract

Background: Paraquat (PQ), a widely used herbicide, can cause severe and often fatal pulmonary fibrosis in humans and in laboratory animals. In many developing countries PQ is widely available and inexpensive, making poisoning prevention difficult. However most of the people who become poisoned from PQ have taken it as a means of suicide. Several therapies including corticosteroids, immunosuppressants and antioxidants have been introduced for PQ induced lung fibrosis, but the effectiveness of them is extremely limited. PQ mainly accumulates in the lung (pulmonary concentrations can be 6 to 10 times higher than those in the plasma), where it is retained even when blood levels start to decrease. The pulmonary effects can be explained by the participation of the polyamine transport system abundantly expressed in the membrane of alveolar cells type I, II, and Clara cells. The main molecular mechanism of PQ toxicity is based on redox cycling and intracellular oxidative stress generation. Thymoquinone (TQ), the main active constituent of black seed essential oil, exhibits promising effects against inflammatory diseases and cancer. TQ, modulates signaling pathways that are key to cancer progression, and enhances the anticancer potential of clinical drugs through reducing their toxic side effects. The purpose of this study was to assess the effect of thymoquinone in two state of treatment and prevention of PQ poisoning.

Methods & Materials: Adult male mice (n =64, 18-30 g) were divided into eight groups. Lung fibrosis induced in mice by a single i.p. administration of 20 mg/kg. Mice were orally administered daily with olive oil, N-acetyl cysteine (NAC) and thymoquinone 20 and 40mg/kg for 10 (treatment) and 21 days (preventive). Lung tissues were removed at days 10 and 21 after PQ injection and histopathologically were examined for fibrosis and inflammation.

Results: TQ could dose-dependently decrease the severity of lung fibrosis in histopathological examinations.

Conclusion: Treatment with TQ decreased hydroxyproline as an indicator of fibrosis. Moreover, the protective effects of TQ was higher when it was administered as pretreatment.

Keywords: Paraquat, Thymoquinone, Pulmonary fibrosis, Mouse

Abstract No: 264

Acute and chronic toxicity of hydroalcoholic extract of *Pinus eldarica* stem bark in rat

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2-Medical university of Isfahan

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Abstract

Background: *Pinus eldarica* Medw is a plant that has been widely used in the traditional medical system as a way to cure Asthma, derma inflammations and wounds. It also decreases the blood sugar and cholesterol. In spite of these effects there are no evidence on the possible toxic effects of *P. eldarica*. In the present study Acute and chronic toxicity of hydroalcoholic extract of *P. eldarica* stem bark in rat was evaluated.

Materials & methods: Rats were orally treated with single doses of *P. eldarica* stem bark hydroalcoholic extract and screened for signs of toxicity one weeks after administration. The Sub-chronic toxicity study was conducted using different dose of *p. eldarica* extract for 30 days.

During the study, Mortality, clinical signs and body weight changes were assayed. In studying about the acute toxicity after one week and in the sub-chronic toxicity study After 30 days animals were sacrificed and hematological and biochemical parameters were measured. There was also Histopathologic studies on the liver and kidney tissue.

Conclusion: In studying about the acute toxicity there wasn't any type of mortality either in male or female rats. The amount of Triglycerides, WBC, Monocytes and lymphocytes was decreased. In contrast, the amount of Eosinophils and neutrophils was significantly increased. Serum creatinine and blood urea had been raised. Histopathologic investigations showed a Mild infiltration around the acute and chronic inflammatory cells of liver and kidney tissue. In analyzing the chronic toxicity no hematological changes were observed a part from significant decrease in Triglycerides amount and Monocytes counts in the rats who received high dose of the extract.

Result: The result of this study shows that hydroalcoholic extract of *P. eldarica* stem bark LD50 is higher than 2000 mg/kg. It also doesn't have toxicity disadvantages in low doses. In contrast, a number of other observations showed that there was a few number of pathological and clinical changes which show the fact that the extract has an effect on the liver and kidney tissue among both female and male rats when it is taken in high doses.

Keywords: eldarica, Acute, Sub chronic, Toxicity, Rat

Abstract No: 455

Survey on phytoestrogens in traditional herbs in Tehran province

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Abstract

Background: The dietary consumption of phytoestrogens has been associated with a lower incidence of prostate, breast, and colon cancer in Iran, where phytoestrogen intake is high compared with that in western countries. Recently many researchers have reported that phytoestrogen intake plays a role in preventing the development of some chronic diseases. To determine the content of phytoestrogens in plants or foods, many quantitative analyses have been performed. In present study we especially focused on the simplification of a column chromatography procedure to remove impurities and to concentrate phytoestrogens, and tried to improve sensitivity.

Methods & Materials: The traditional medicinal herbs examined were as follows: Bupleuri radix, Cimicifugae rhizome, Acanthopanacis cortex. All traditional dried herbs (500g) were extracted with a mixture of water and methanol (15:85) under a sonicator (25°C) for 1 hour (3 times), and the filtered MeOH extract was evaporated under vacuum. All phytoestrogens, quercetin, catechin, genistein and daidzein obtained from Sahand laboratory. The derivatization with the mixture of MSTFA/NH₄I/DTE improved the detection limits of phytoestrogens (0.02–0.4 µg/100 g) in GC-MS analysis about 10–100-fold compared with previous reports (2–3 µg/100 g). To remove the glycosides of lignans, we hydrolyzed the aqueous phase by adding 50 µL of 6 mol/L hydrochloric acid, and incubating it at 100°C for 2.5 hours.

Results: Concentration founded in 20 µg/g of Concentration added in kaempferol was 20.36 ± 1.88 and in quercetin was 21.51 ± 1.34 and in daidzein with 40 µg/g of Concentration added was 44.01 ± 32.22 .

Conclusion: These results indicate that this assay is accurate and reliable for the determination of phytoestrogens in herbs. Also, information regarding the phytoestrogen contents in traditional medicinal herbs is useful in the prevention and treatment of chronic diseases such as cancer, osteoporosis, dementia, and cardiovascular disease.

Keywords: phytoestrogens, herb, traditional

Abstract No: 452

Evaluation of antioxidant activity of plant extract and fractions of *Otostegia persica*

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Abstract

Background: Antioxidants are compounds that slow down oxidation by scavenging free radicals, prevention the decomposition of peroxides and metal Chelation and can be used for decreasing oxidation. Low levels of antioxidants in the body causing oxidative stress, which can lead to cell damage or death. Despite various antioxidants in the plasma, the immune system alone cannot eliminate free radicals in the body, hence it is need to provide essential antioxidants from external sources. Due to the harmful effects of consuming carcinogenic synthetic antioxidants such as BHT, BHA, TBHQ , the interest is the usage of natural antioxidants.

Methods & Materials: Ethanol extract of *Otostegia persica* extract was fractionated by using different solvents such as petroleum ether, chloroform, ethyl acetate and n-buthanol. Then antioxidant activities of the extract and its fractions were assessed by measuring reducing power and DPPH radical scavenging. Gallic acid was used as an antioxidant standard. Total phenolic and flavonoid contents were measured by spectrophotometer.

Results: In this study, the highest the antioxidant activity was found in extract and ethyl acetate fraction and antioxidant activity increased by increasing the concentrations of the samples.

Conclusion: Finally, the results of this study indicate that *Otostegia persica* may be an excellent source of natural antioxidants.

Keywords: *Otostegia persica*; DPPH radical scavenging; reducing power; phenolics; flavonoids

Abstract No: 447

Protective Effect of Hydromethanolic Extract of *Lactuca virosa* against Hepatotoxicity due to Acetaminophen in Female Rats

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Abstract

Background: Acetaminophen overdose is the most frequent cause of liver injuries. N-acetyl-p-benzoquinone imine (NAPQI) has been proposed as the toxic metabolite of acetaminophen induced by cytochrome P-450. Wild lettuce (*Lactuca virosa*) contains N-methyl beta-phenyl ethylamine that is structurally similar to amphetamine and has been introduced as an inhibitor of cytochrome P-450 which prevents formation of the active metabolite of acetaminophen. In this study, the protective effect of the hydromethanolic extract of wild lettuce was examined against acetaminophen-induced hepatotoxicity in female rats.

Methods & Materials: Forty-five rats were randomly divided into nine groups (four control and five test groups). Acetaminophen (6g/kg) was administered orally to induce liver necrosis and wild lettuce extract (WLE) (1g/kg) was administered via intra-peritoneal route at 0, 30, 60, 90, and 120 minute after acetaminophen administration. After 60 hours, blood samples were collected for the analysis of ALT (alanine aminotransferase), AST (aspartate aminotransferase) and GPX (Glutathione peroxidase). For statistical analysis of the data, group means were analyzed with one way ANOVA followed by Duncan's test for multiple comparisons.

Results: Serum levels of ALT and AST in several treatment groups were significantly ($P < 0.05$) reduced compared to group 2 (acetaminophen control). Reduction of ALT was more prominent in groups 5, 7 and 9 (treatment groups). AST level was significantly ($P < 0.05$) decreased in groups 5, 6 and 9 (treatment groups) ($P < 0.05$). A significant ($P < 0.05$) higher level of GPX was shown in acetaminophen control compared to all other groups except in WLE group.

Conclusion: The results indicate that WLE may exert a protective effect against hepatotoxicity due to acetaminophen and it partially prevents GPX elevation. In other word, WLE can decrease the need for high antioxidant capacity to deal with NAPQI, produced following acetaminophen toxicity.

Keywords: Acetaminophen toxicity, Wild lettuce, Hepatotoxicity, Rats

Abstract No: 401

Hepatotoxicity associated with the ingestion of Rosa Cannina L. hydroalcoholic extract in rat

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Abstract

Background: Since traditionally herbal products and many plants are commonly used in the treatment of various illnesses around the world, adverse effects such as hepatotoxicity are observed. The fruits of Rosa canina L. have been used traditionally for the prevention and therapy of various ailments, including haemorrhoids, diabetes mellitus, arthritis, rheumatism, gout, sciatica, colds, influenza and gallstones. The present study evaluated the possible hepatotoxicity effect of hydroalcoholic extract of Rosa canina L. in rat model.

Methods & Materials: In this experiment, 24 Wistar rats were divided randomly into four groups (n = 6). These groups received tap drinking water (group I), 250 mg/kg Rosa canina L. extract (group II), 500 mg/kg Rosa canina L. extract (group III), or 1000 mg/kg Rosa canina L. extract (group IV) for a period of 21 days. Hepatic function has been monitored by evaluating the serum levels of GOT and GPT. In comparison with normal rats (group I), GOT and GPT levels were significantly higher in group III and IV, respectively.

Results & Conclusion: The elevated GPT and GOT levels following high doses of treatments (500 and 1000 mg/kg) may be an indicator of hepatocellular damage. Therefore, when this herbal product is used for treatment of various illnesses, the dosage should be carefully determined to decrease the side effects.

Keywords: Rosa Cannina L., Hepatotoxicity, liver marker enzymes

Abstract No: 395

Inhibitory Effect of Extracts of Lemon Balm and Combined with Diclofenac on Bleomycin Pulmonary's Effect in the Rat

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Abstract

Background: Bleomycin (BLM) is an antibiotic with antitumor activity which is an Anti-cancer drug. The main problem of this drug in many cases is a serious complication of pulmonary fibrosis. In the present study, the effect of antioxidant properties of Lemon balm(LB) extract were investigated and the combined ethanol extracts of lemon balm(LB) with antioxidant feature in order to eliminate free radical generated and Diclofenac(DEF) to prevent the process of inflammation through inhibition of Cyclooxygenase 1 and 2 in an animal model of rat.

Materials & Method: In this study, 4 groups of adult male Wistar rats (200±20g) were selected : (1) positive control bleomycine, (2) negative control normal saline , (3) ethanol extracts of lemon balm, (4) the combination of Diclofenac and ethanol extracts of lemon balm .Except for the control group, which was given a single dose of 0.3ml endotracheal of sterile saline, other groups were given endotracheal BLM administration of 1 unit per 100g of body weight per volume 0.3ml. Daily 75mg per kg of extract lemon balm herb at the LB group, 600mg the drug and 75mg of plant extract intraperitoneally at the same time at the combination group, as the treatment of a 7-day pre-treatment period and for 14 days after intratracheal administration of BLM were administered.

Result: The results indicate that the Lung weight and the hydroxyproline (OH-Proline) content and the content of malondialdehyde (MDA) and proportion of Lung weight to body weight on the last day in lungs in BLM group compared to the control group have shown 65 and 73 and 129 and 99 percent increase respectively ($p<0.05$)%. The increase of the above-mentioned factors in the combination group compared to the control group were 10 and 19 and 7 and 15 percent, respectively ($p>0.05$) % . , In LB group, increased factors compared to the control group were 15 and 26 and 30 and 25 percent respectively.

Conclusion: The results obtained based on the property of LB antioxidant is able to inhibit the accumulation of collagen. and in the combination group, these two compounds are able to inhibit the accumulation of collagen and expected results were obtained experimentally. It might be a good place in the complex treatment.

Keyword: Bleomycin, Lemon balm , Diclofenac, Pulmonary Fibrosis

Abstract No: 394

Reductive Effect of Antioxidant and Anti-inflammatory on Bleomycin-induced Pulmonary Fibrosis by Propylene Glycol Propolis Extract and Combination of Propylene Glycol Propolis Extract together with Methimazole in Rat's animal Model

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Abstract

Background: Bleomycin (BLM) is an effective antineoplastic drug, particularly when used in conjunction with other cytostatic drugs. It binds to and damages DNA of tumor cells and has fewer side effects than most other antitumor drugs. However its wider use is limited by pronounced pulmonary fibrosis. The purpose of this study is the effect of Propylene glycol extract of propolis (PP) with strong anti-inflammatory properties and effect of anti-thyroid drug methimazole with antioxidant benefits and effects of PP as well as the combined effects of these two substances on bleomycin-induced pulmonary fibrosis in male Wistar rats.

Materials & Method: The experiment, male Wistar rats (weighting 200 ± 20 g) were divided randomly into 5 groups. These groups include: (1) bleomycine, (2) normal saline, (3) Propylene glycol, (4) PP, (5) the combination of methimazole and PP. Aside from the control groups that received a single dose of 0.3 ml of sterile saline into the trachea, other groups were administered intratracheal BLM at a rate of 1 unit per 100g of body weight per volume 0.3mL. Each animal, daily, in the group treated with PP was given 50mg / kg of Propylene glycol extract of propolis and in the combination group was given 80mg/kg methimazole and 50mg/kg PP at the same time as the treatment of a 7-day per-treatment period and for 14 days after intratracheal administration of BLM. In order to measure hydroxyproline (OH-proline), malondialdehyde (MDA), The lung weight and proportion of Lung weight to body weight on the last day.

Result: The content of OH-proline and also the content of MDA and the lung weight and proportion of Lung weight to body weight on the last day were elevated significantly 72,128,67.8,74% respectively in BLM group compare with sterile saline group $P < 0.05$. The content of the OH-proline, MDA and the lung weight and proportion of Lung weight to body weight on the last day increased 10.6,4.8,0.7,0% in the combination group compare with sterile saline group. which shows a reasonable difference compared to the BLM group. In PP group also, these factors compared to control group 2 increased 32,17.5,27.7,11percent.

Conclusion: It was concluded from the present study that the administration of PP due to strong anti-inflammatory and antioxidant resulted in a decrease in these factors. Regarding the

mechanism of the effects of methimazole including removing active oxygen species and inhibit TNF secretion of prostaglandin E2, the combination of methimazole and PP can be used to control the lung fibrosis.

Keyword: bleomycin, methimazole, propylene glycol extract of propolis, pulmonary fibrosis

Abstract No: 389

Rate of fertility in male rats treated with Aqueous Extract *Melissa officinalis* L. (AEMO)

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Abstract

Background: *Melissa officinalis* (Lemon balm), a valuable medicinal plant in herbal medicine which has many different therapeutic effects such as: sedative, ant oxidative and antispasmodic effects. The aim of this study was to investigate the histological changes of testis which treated with aqueous extract *Melissa officinalis*.

Materials & Methods: In this experimental study, 18 wistar male rats were randomly divided into three groups. Control and two experimental groups. Control group treated with normal diet, experimental groups received AEMO for 4weeks at doses 10 and 100 mg/kg by gavage. At the end of treatment, the rats were anaesthetized; blood samples were taken from the heart for measurement of serum testosterone concentrations. The testis were removed and transferred to formalin 10%. Then histological sections were performed and stained with H & E and studied by light microscopy. All data were analyzed with spss software.

Results: The results showed that the weight of the animals in the treated group with extract 100 mg/kg dose declined. Level of testosterone in treated group with 10 mg/kg AEMO significantly ($p<0.05$) increased as compared to the control group. Histological studies showed that of thickness epithelium, spi, MI and number of leydig cells significantly ($p<0.05$) decreased in treated group with 100 mg/kg AEMO in compared with control group.

Conclusion: Aqueous extract of *Melissa officinalis* with high dese (100 mg/kg) has negative effect on the reproductive system in male rats.

Keyword: *Melissa officinalis*, Fertility, Male rat, Testosterone

Abstract No: 546

Teratogenic Effect of *Lippia citriodora* Leaves Aqueous Extract in Mice

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Abstract

Background: Safety of *L. citriodora*, as herbal remedy, in pregnancy has not yet recognized. This study aimed to identify effect of *L. citriodora* aqueous extract on pregnancy outcome in mice.

Materials and Methods: Timed-pregnant mice received doses of 0.5 mg/kg/day *Lippia citriodora* aqueous extract or the vehicle control during organogenesis, intraperitoneally. Maternal body weights were measured throughout pregnancy. The litters were examined for external malformations and skeletal abnormalities fetuses were stained with Alizarin red S and Alcian blue.

Results: There was no significant in mean maternal weight gain during pregnancy between groups. No significant differences also were observed in mean number of implantation, live and resorbed fetuses between control and treated groups. The prevalence of all types of deformity was low and similar to treated group (%1.11).

Conclusions: The results of this study shows that moderate consumption of *Lippia citriodora* as an infusion or tea appear to be safe during pregnancy and does not have toxic effects on development of mouse embryo.

Keywords: *Lippia citriodora*, Teratogen, Herbal medicine

Drug Toxicity

Abstract No: 549

Toxicity of macrolide antibiotics on isolated heart mitochondria: A justification for their cardiotoxic adverse effect

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Abstract

Background: Macrolides belong to the polyketide class of natural products. These products are a group of drugs (typically antibiotics) whose activity stems from the presence of a macrolide ring. Antibiotic macrolides are used to treat infections caused by Gram- positive bacteria and Haemophilus influenzae infections such as respiratory tract and soft-tissue infections. Macrolides, mainly erythromycin and clarithromycin, rarely show QT prolongation, as their infamous adverse reaction which can lead to torsades de pointes. Electrophysiological studies showed that macrolides prolonging the QT interval inhibit the rapid component of the delayed rectifier K⁺ current (I_{Kr}) through the block of potassium channels encoded by the human ether-a-go-go-related gene (HERG). Studies suggest that increased ROS generation alters the kinetics of hERG K⁺-conductance.

Methods & Materials: In our study, rat cardiomyocytes were isolated with collagen perfusion technique. Finally mitochondria isolated from cardiomyocytes were exposed to Erythromycin, Azithromycin and Clarithromycin for their probable toxicity effects.

Results: Our results demonstrated that macrolides induced reactive oxygen species (ROS) formation, mitochondrial membrane permeabilization (MMP), and mitochondrial swelling and cytochrome c release in cardiomyocytes mitochondria.

Conclusion; These findings suggest that toxicity of heart mitochondria can be considered as a starting point for cardiotoxic effects of macrolides including QT prolongation, torsades de pointes and arrhythmia.

Keyword: Mitochondria; Erythromycin; Azithromycin; Clarithromycin; Cardiotoxicity

Abstract No: 543

Preclinical assessment of β -D mannuronic acid as a non-steroidal anti-inflammatory drug

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Abstract

Background: The study was designed to determine the acute and subchronic toxicity of β -D-mannuronic acid in healthy NMRI mice and Wistar rats, respectively.

Methods & Materials: For the acute toxicity study, the animals received orally five different single dose of β -D-mannuronic acid for 14 days. In the subchronic study, 24 rats were divided into four groups and were treated orally once daily with different doses of β -D-mannuronic acid for at least 63 consecutive days. Mortality, body weight changes, hematological and biochemical parameters, organ weights and histopathological determinations were monitored during the study.

Results: The results of acute toxicity indicated that LD50 of β -D-mannuronic acid is 4.6 g/kg. We found no mortality and no abnormality in body weight, relative organ weights, hematological, biochemical and histopathological parameters in any of the animals in the subchronic study.

Conclusion: Our results suggest that β -D- mannuronic acid is relatively safe when administered orally in animals.

Keywords: β -D- mannuronic acid; Non-steroidal anti-inflammatory drugs; Acute toxicity; Subchronic toxicity

Abstract No: 66

Deuterium depleted water modulates hepatic metabolizing enzymes

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Abstract

Background: liver is the biggest organ of body and one of the most important functions of liver, is to detoxify the xenobiotics, environment contaminants and chemotherapy drugs. Toxicity with acetaminophen is considered as the most common reason of acute liver failure. Although, this toxicity depends on the drug dose but this impairment has clinical variability. The main cause of liver toxicity is related to metabolic activity of APAP through cytochrome P450 (CYP450) and glutathione s-transferase (GST) via its active metabolite i.e NAPQI. In the recent years, great attention had been to effects of natural compounds and plants in treatment and prevention of toxicity resulted from drugs. Regarding the history of using deuterium depleted water (DDW), its biological effects are conceivable and it is considered a useful therapeutic supplement.

Methods & Materials: The adult male rats were divided into 16 groups. The negative control group used tap water in 14 days following DMSO i.p injection at day 15. The control group received tap water in 14 days following 500 mg/kg b.w. acetaminophen dissolved in DMSO i.p injected. The treatment groups received 30 and 60 ppm DDW in 14 days following acetaminophen injection at day 15. Then, at 4, 8, 16 and 24 h after treatments, taking blood from the hurt and separating the liver tissue were done. Then, the glutathione level together with the activities of GST and CYP450 were measured in liver hemogenates.

Results: acetaminophen treatments caused significant increase in the CYP450 together with decreasing the GST activities concomitant with GSH depletion. Treatments of rats with DDW could modulate these parameters to normal values.

Conclusion: the treatment of rats with high dose of acetaminophen caused liver oxidative damage and the use of deuterium depleted water can be effective in preventing and improving these damages.

Keywords: Acetaminophen, Liver toxicity, Deuterium depleted water, Liver damage

Abstract No: 49

Neurotoxicity evaluation of 4 - methylimidazole using isolated mitochondria in of NMRI mouse

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Abstract

Background: 4-Methylimidazole (4-MEI) is a compound used to make certain pharmaceuticals, photographic chemicals, dyes and pigments, cleaning and agricultural chemicals, and rubber products. 4-MEI is formed during the production of certain caramel coloring agents used in many food and drink products. It may also be formed during the cooking, roasting, or other processing of some foods and beverages. The purpose of this study was to evaluate the neurotoxicity effects of 4-methylimidazole using of in vivo and experimental models

Methods & Materials: We used of mitochondrial tests including (ROS formation, mitochondrial potential collapse, mitochondrial swelling) as a model of evaluation mitochondrial toxicity factor. 4-methylimidazole (100,200,300 mg/kg) or this vehicle (Saline) was injected oral by gavage for 14 consecutive days. and mitochondrial disorders were assessed fifteenth day. The results are expressed as mean \pm SEM and were analyzed using Graph Pad Prism software. One-way analysis of variance (ANOVA) followed by Dunnett's, Tukey's, or Bonferroni's were used for multiple comparison tests. For all analysis $P < 0.05$ was considered significant.

Results: Treatment with 4-methylimidazole during 14 days showed rise in mitochondrial ROS formation, mitochondrial membrane potential collapse before mitochondrial swelling decline.

Conclusion: 4-methylimidazole produced neurotoxicity in NMRI male mice. Our results showed that 4-MEI could interact with respiratory complexes. We finally concluded that 4-MEI induced brain toxicity is the result of disruptive effect on brain mitochondrial respiratory chain which is.

Keyword: neurotoxicity ,4 - methylimidazole ,isolated mitochondria ,NMRI mouse

Abstract No: 458

Histopathological investigation of clonazepam toxicity in brain tissue of Rats

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Abstract

Background: Clonazepam is a benzodiazepine derivative with sedative, anticonvulsant, and anxiolytic effects, and the euphoric effect makes it a popular drug of abuse. Although clonazepam is considered to be safe, there are several reports indicating its cytotoxic effects on kidney and liver tissues. Here in current study, we aimed to evaluate the histopathological impact of clonazepam on brain tissue.

Methods & Materials: For this purpose, mature male rats were assigned into control and experimental groups. The animals in experimental groups received 2mg/kg, 4mg/kg and 8 mg/kg from clonazepam, dissolved in saline normal, orally for 28 days. Control group received 0.5mL saline normal (same volume as solvent for clonazepam). Brain samples were dissected out and underwent routine histopathologic procedure for H&E staining.

Results: Significant neurodegeneration, neuronal necrosis and decrease in the number of neurons were observed. Comparing the groups with each other showed that the high dose administrated group exhibited more intensive damages versus medium and low dose-exposed ones. Accordingly, extended necrosis, remarkable reduction in neurons number per one mm² as well as cytotoxic and vasogenic edema were revealed in high dose clonazepam-received animals.

Conclusion: In conclusion, our data showed that clonazepam in a dose dependent manner elevates the neuronal damages. Moreover, clonazepam should be administrated at right dose and shouldn't be consumed without physician prescription.

Keyword: Clonazepam, Histopathology, toxicity, Brain Tissue, Neuronal necrosis

Abstract No: 469

The Protective Effect of Edaravone against Diazinon-Induced Neurotoxicity

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Abstract

Background: Diazinon, an organophosphate insecticide, has been used worldwide in agriculture and domestically for several years, which has led to neurotoxicity as a result of induction of oxidative stress. This study examined whether edaravone, a radical scavenger, protects against diazinon-induced neurotoxicity.

Methods & Materials: We had six rats in every group including control, diazinon, Edaravone and treatment group that received edaravone 30 minutes before diazinon. After 24 hours, animals were killed, brain tissue was separated, isolated and oxidative stress markers (ROS, lipid peroxidation, glutathione, protein carbonyl and catalase activity) were measured.

Results: ROS, lipid peroxidation and protein carbonyl increased after diazinon exposure but was significantly decreased with edaravone pre-treatment. Diazinon decreased the brain levels of glutathione and catalase activity. Edaravone significantly increased the levels of these two markers.

Conclusion: Edaravone is shown to be promising candidates for use in the suppression of neurotoxicity of diazinon.

Keywords: Edaravone, Diazinon, Neurotoxicity, Oxidative stress

Abstract No: 334

Effect of sulfadiazine in the histopathology of renal lesions and oxidative stress changes in chicken embryos

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Abstract

Background: Studies revealed that the presence of sulfonamides residues in food is considered to be harmful to consumers. In poultry science, sulfonamides have been used for treating of various diseases like coccidiosis, infectious coryza, pullorum disease and flow typhoid. The aim of present study was to evaluate the sulfonamide-associated nephrotoxicity with possible underlying mechanisms in chicken embryo.

Materials & Method: One hundred fertile eggs were obtained and divided to five groups: 1) control group (without injection), 2) group injected with 2 mg sulfadiazine 3) group injected with 10 mg sulfadiazine 4) group injected with 30 mg sulfadiazine 5) group injected with 70 mg sulfadiazine. After hatching, the renal tissue from the newly hatched chick was harvested for histopathologic investigation and also measurement of oxidative stress parameters (The ferric reducing capacity assay, the glutathione content (GSH) and the situation of lipid peroxidation (LPO)).

Results & Conclusion: Histopathological examination of the renal tissue revealed that sulfadiazine induces hydropic degeneration, tubular necrosis, glomerular and tubular atrophy, formation of hyaline cast, congestion, hemorrhage, interstitial nephritis and fibrosis. Result showed the dose-dependent administration of sulfadiazine significantly altered the histopathologic structure of renal tissues of chickens. Furthermore, the major histopathologic events in the course of sulfadiazine cytotoxicity are renal tubule epithelial cell necrosis, interstitial nephritis and fibrosis, formation of hyaline cast and congestion and hemorrhage, although sulfadiazine at dose 30 mg and 70 mg caused perturbation in antioxidant defense system by marked increase in LPO, and decrease in GSH.

Keywords: sulfadiazine, renal lesions, chicken embryos, histopathology

Abstract No: 276

EPIDEMIOLOGICAL STUDY OF DRUG POISONING IN CHILDREN

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Abstract

Background: Poisoning represents one of the most common medical emergencies in Childhood and unintentional drug intoxication is still a major cause of morbidity and mortality in children. In this study we attempt to evaluate the epidemiology of drug poisoning in children.

Materials & Methods: This was a cross-sectional descriptive study, being performed in Tabriz children hospital-Tabriz University of Medical Sciences during the years 1392 to 1393. The study included pediatric patients hospitalized due to acute poisoning. Demographic and Etiological factors were recorded and analyzed.

Results: During this period, 80 cases of poisoned children were hospitalized in children hospital, in majority of 40 cases, poisoning was due to drug poisoning that including hematinic capsule (25%), Contraceptive (22%), sedative (15%), antibiotics /opioids (10%), anti-inflammatory/ alcohol (5%) respectively. Other 40 cases were including: pesticides (16%), toxic fungus (14%), household detergents/ aromatic hydrocarbon (10%) respectively. About 61% of cases were hospitalized between 24-48 hours. Most of the poisoning cases in children were unintentional and in many cases, their parents played a critical role in their intoxication. For the 71 cases, 80 cases of poisoning have occurred in smoking parents. There were a significant correlation between age, Parent education and poisoning location with degree of certainty (0.95). More poisoning occurred at the age of 1-3 years. Also out of 80 cases, 48 cases of poisoning have occurred in cities and 32 in rural areas. The fungous and aromatic hydrocarbon poisoning were more common among children of rural areas.

Conclusion: our study substantiated that their parents played a critical role in their intoxication. Also easy access to toxic material is the most common risk factor for acute childhood poisoning. Thereby, we suggest that Primary and secondary prevention programs cannot be successful without taking this factor into consideration.

Keywords: Epidemiology, Drug poisoning, Children

Abstract No: 245

Crystal meth toxicity from anemia to spatial memory impairment

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Abstract

Background: It is known that crystal meth has toxic effects on the cardiovascular and central nervous systems. In the field of cardiovascular system, crystal meth affects blood pressure (BP), heart rate (HR), electrocardiogram (ECG) parameters and the risk of sudden death. In the field of central nervous system, crystal meth causes the lesion of dopaminergic and serotonergic nerve terminals in brain. The aim of this study was to investigate the impairment effects of crystal meth on blood cells count and spatial memory.

Material and Methods: In this experimental study, 28 male adult rats were used. The rats were divided into four groups; normal control group, crystal meth groups with three doses (5, 10, and 15 mg/kg). The period of intraperitoneal injection (IP) was once a day for 5 consecutive days. The Morris water maze used for studying the spatial learning and memory for 5 consecutive days. Also after the last injection in fifth day, the blood samples were taken from rats and analyzed for platelets, red and white blood cells. Data analysis was performed by using one way ANOVA.

Results: findings showed that the count of platelets, red and white blood cells, in crystal meth groups (10, 15 mg/kg) were significantly decreased in comparison with control group ($p < 0.05$). Hemoglobin and hematocrit levels were significantly decreased in crystal meth group in comparison with control group ($p < 0.01$). Also I.P injection of crystal meth in the doses of 10 and 15 mg/kg significantly decreased the spatial memory ($p < 0.01$).

Conclusion: Our data showed that Ecstasy is able to induce anemia by decreasing the total red blood cells, hemoglobin and hematocrit. Also crystal meth as an amphetamine has damaging effects on spatial memory. It seems that crystal meth can damage the hippocampal neurons and can cause more severe cognition disorders.

Keywords: Crystal meth toxicity, spatial memory, Anemia

Abstract No: 205

The survey of drug use patterns and its association with toxicity and adverse drug reactions in elderly in Gonabad

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2-Ms in Geriatric Nursing

Abstract

Background: Several diseases in the elderly, taking multiple concomitant medications along with physiological and cognitive-perceptual changes associated with aging, increase the risk of toxicity and adverse drug reactions in the elderly.

Methods: In this cross-sectional analytical study, 323 participants were categorized according to systematic stratified method. Data were collected using interview and questionnaire including these three parts: demographic data, drug use pattern and toxicity and adverse drug reactions. Data were analyses using SPSS software (V.19), descriptive statistics, chi-square and ANOVA.

Results: %72/1 of the samples was taking medication. The average dose was $4/06 \pm 0/3$ per day. Polypharmacy (daily intake four or more drugs) in 56/6 percent of the samples were observed. A-S-A, Atenolol and Ranitidine were the most consumed drugs. Pharmacological drug groups commonly include heart-vascular (%67/8), Gastrointestinal (%42) and anticoagulant (%31/7). Toxicity and adverse drug reactions has significant relation with Polypharmacy ($P < 0/0001$) and sex ($P < 0/0001$), occupation ($P = 0/004$), medication compliance ($P = 0/017$). Disorders of consciousness (%52), changes in appetite (%39) and bowel elimination (%35) were the most common complication. Followed a complication, %52/1 of patients were referred to a physician and %19/5 of them had stopped taking his medication. Incidence of drug toxicity was not reported.

Conclusion: Polypharmacy is major pattern of drug use among elderly which is associated with an increased risk of toxicity and adverse drug reactions. Drug toxicity in the elderly because of its nonspecific symptoms not properly diagnosed.

Keyword: Drug Use Pattern, Polypharmacy, Elderly, Drug Toxicity, Adverse Drug Reaction

Abstract No: 143

Study on biodegradation and detoxification of ketoconazole by laccase in aqueous medium

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Abstract

Background: Pharmaceutical agents and their metabolites are commonly found in the environment and regarded as emerging environmental pollutants since many of them are ubiquitous, recalcitrant, and biological active. One of the most popular, effective, and attractive green technology for removal of contaminants is the enzymatic treatment of chemicals to clean up the environment. Ketoconazole, an antifungal agent, is a pharmaceutical compound that widely used in human and veterinary medicine. The accumulation of this aromatic compound in the environment may cause serious problems for sensitive living things.

Methods & Materials: The present study investigates the use of laccase-catalyzed oxidation for removing of ketoconazole in aqueous solution. The major parameters that can affect on the enzymatic removal process are temperature (45°C), pH (4.5), time (6 h), the concentration of ketoconazole (0.3 mg), and laccase activity (1 U).

Results & Conclusion: Analysis by high performance liquid chromatography (HPLC) demonstrated the complete removal of ketoconazole in the present of laccase. Loss of growth inhibition of *Candida albicans* was also observed in undetectable levels of ketoconazole in the enzymatic treatment that exhibited eco-toxicity reduction of ketoconazole metabolites unlike ketoconazole.

Keywords: Enzymatic process, Laccase, Ketoconazole, Removal, Toxicity

Abstract No: 47

Protective Effect of Royal Jelly against Phenylhydrazine-induced Hepatotoxicity in Mice

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Abstract

Background: Phenylhydrazine (PHZ), a recognized oxidant agent, can cause a variety of side effects including hepatic disorders. The present study aimed to explore the possible hepatoprotective effects of royal jelly (RJ) on PHZ-induced hepatotoxicity in mice. In this randomized controlled experimental study, adult male mice were categorized into four groups of eight mice each.

Methods & Materials: Two groups of mice received PHZ at a dose of 60 mg/kg per 48 hours intraperitoneally for 35 days. RJ was administered to one of these groups at a dose of 100 mg/kg per day orally four hours before PHZ injection. A vehicle-treated control group and an RJ-only treated group were also included. Serum and hepatic samples were collected 24 hours after the last treatment and subjected to biochemical and histomorphometric examinations, respectively.

Results & Conclusion: PHZ treatment caused a significant elevation ($P < 0.05$) in serum concentrations of aspartate transaminase, alanine transaminase, alkaline phosphatase, lactate dehydrogenase and malondealdehyde and decreased serum level of total antioxidant capacity, superoxide dismutase and albumin. Moreover, PHZ significantly increased diameters of hepatocytes and their nuclei as well as number of Kupffer cells. Notably, RJ Pretreatment improved all changes in the above-mentioned parameters. RJ by virtue of its antioxidant properties can reduce PHZ-induced hepatic damages in mice.

Keywords: Royal jelly, Phenylhydrazine, Liver, Mouse

Abstract No: 570

The neurotoxicity effect of Bisphenol A on spatial memory and oxidative stress in male rats.

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Abstract

Background: Bisphenol A is a xenoestrogen synthesized in large amount to produce polymers (polycarbonates, epoxy resins) and thermal paper. Bisphenol A easily pass the blood-brain barrier. It has been reported that bisphenol A impact the central nervous system especially neurogenesis and synaptic transmission. So the aim of this study is to investigate the effects of chronic administration of bisphenol A on spatial learning and memory as well as in oxidative stress adult male rats.

Method & Materials: thirty two male Wistar rats were randomly divided into four groups (n= 8) as following: control, BPA (10 and 50 and 100 µg/kg). Bisphenol A was administrated intraperitoneally for 15 days. The Morris water maze for studying the spatial learning and memory was used for 5 consecutive days. The left hemisphere of rats were used to measure some of the oxidative stress markers. The activities of antioxidative enzymes, such as superoxide dismutase (SOD) and catalase (CAT) were determined in the rat's. Data analysis was performed by using one way ANOVA.

Results: Intraperitoneal injection of bisphenol A showed that treatment with BPA in the doses of 10 and 50 µg/kg reduced spatial memory when compared to the control group (p<0.05). Reduction of spatial memory in the dose of 100 µg/kg was very severe in comparison to control group (p<0.01). All doses of bisphenol A can significantly increased the amount of superoxide dismutase (SOD) in comparison with control group p<0.001). There was no significant difference (p<0.001) in catalase levels between experimental and control groups.

Conclusions: The observations reveal that bisphenol A by induction of oxidative stress in brains results in memory dysfunction. Future work should be aimed for demonstrating.

Keywords: Bisphenol A, Oxidative stress, rat

Abstract No: 243

Sulfasalazine-induced hepatic injury in an ex vivo model of isolated perfused rat liver and the protective role of taurine

Ayat Dashti

Abstract

Background: Sulfasalazine is one of the most commonly administered drugs for the treatment of rheumatoid arthritis and irritable bowel disease in human. On the other hand, acute liver failure resulting in need for liver transplantation and/or patient death might occur after sulfasalazine administration. There is no precise mechanism for hepatic injury induced by sulfasalazine and no specific hepatoprotective agent has been developed against this complication.

Materials & Methods: Current investigation was designed to study the mechanism of liver injury induced by sulfasalazine and evaluate the role of taurine as a safe hepatoprotective agent against sulfasalazine-induced liver injury. Rat liver was isolated after cannulation through portal vein and perfused by Krebs-Henseleit buffer. The liver was exposed to different concentrations of sulfasalazine and taurine.

Results: It was found that 5 mM of sulfasalazine caused significant hepatic injury as judged by elevation in liver perfusate level of LDH, AST, ALT, and potassium ion (K⁺). Moreover, a significant amount of reactive oxygen species formation, lipid peroxidation and hepatic glutathione depletion in addition of liver histopathological changes were detected in sulfasalazine-treated group. Co-administration of taurine (5, 10 and 20 mM), significantly mitigated sulfasalazine-induced hepatic injury in isolated perfused rat liver.

Conclusion: The data obtained from current investigation indicate potential therapeutic properties of taurine against sulfasalazine-induced liver injury.

Keywords: Amino acids, Drug-induced Liver Injury, Hepatotoxicity, Mechanistic Toxicology, Oxidative Stress.

Abstract No: 572

Different Doses of Deltamethrin Resulted in Pathological Damages in liver tissue of the Rats

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Abstract

Background: Due to wide spread usage of pesticides, concerns about the side effects of these compounds are increasing. Deltamethrin, pyrethroid pesticide, is known for pathologically affecting the central nervous system and laboratory animals' behavior.

Method & Materials: Thus, present study was conducted in order to evaluate the dose effect of DMN on liver. Twenty four mature virgin female Wistar rats were assigned into four groups as test and control-sham. The animals in control-sham group received corn oil (0.5mL). The test group subdivided into 3 groups as; low dose DTM-administrated (1mg/kg^{-1}), medium dose DTM-treated (3mg/kg^{-1}) and high dose DTM-received (7mg/kg^{-1}). All animals received the chemicals orally by gavage for 14 days. On day 15, the animals were euthanized and the livers were dissected out and underwent histological analyses. Moreover, the serum samples were collected and serum level of SGOT and SGTP were investigated.

Results: The histological study of liver sections of test group with H&E staining revealed that DMN, dose dependently, enhanced the pathological damages including: severe hepatocytes degeneration, immune cells infiltration, CV congestion and necrosis. The biochemical analyses showed increased SGTP and SGOT in DMN-received animals versus control group.

Conclusion: Our data suggest that DTM can cause severe histological and functional damages in liver depending on dose. Moreover, the DTM exerts its pathological damages via down-regulating the antioxidant status.

Keywords: Deltamethrin, liver tissue, Pathological alterations, SGOT, SGPT

Abstract No: 313

Protective effects of Glycine against anti-malarial drugs hepatotoxicity in rats

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Abstract

Background: Drugs such as Amodiaquine and Chloroquine are the first line treatment against malaria, however, taking this drugs accompany with development of hepatotoxicity in patients. Purpose of this study is evaluation of protective effects of glycine against chloroquine and Amodiaquine hepatotoxicity in rats.

Materials & methods: 32 Adult male rats were divided in 7 groups with 4 rats in each group: 1. Control group/ 2, 3 patient groups /5-7 treated with glecine. All materials were injected intraperitoneally. Amodiaquine single dose 360 mg / kg and chloroquine 970 mg / kg daily for 3 days were administered to groups of 2 to 7. Doses 500 and 1000 mg / kg of glycine were injected 1 h after drugs administration. Finally, Serum markers of liver damage and antioxidants in liver homogenates of rats were examined. Histopathology was performed in order to assess the degrees of liver injury.

Results: In groups treated with glycine, levels of lipid peroxidation in liver, serum ASTand LDH reduced significantly and hepatic glutathione levels increased considerably. Serum ALT levels in the groups that received glycine with chloroquine, was increased significantly. (P<0.05)

Conclusion: Glycine possibly protect liver against toxic effects of chloroquine and Amodiaquine by reduce oxidative stress and improving the storage of glutathione.

Keyword: Glycine, Amodiaquine, Chloroquine, Liver toxicity, Oxidative stress, Rats

Abstract No: 324

Effect of linolenic and linoleic fatty acids on the palmitic acid induced lipotoxicity indices in the primary culture of adult rat cardiomyocytes

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Abstract

Background: Lipotoxicity is the process through which accumulation of neutral lipid overload leads to cellular dysfunction, cell death, and eventually, organ dysfunction. The prevalence of cardiovascular disease due to lipotoxicity has been dramatically increased worldwide, in human and some species of animals. In a variety of experimental systems, saturated and unsaturated FAs differ significantly in their contributions to lipotoxicity. It was reported that linolenic and linoleic acid prevented the lipotoxicity in hepatocytes. To the authors knowledge the effects of linolenic and linoleic acid on adult rat cardiomyocyte had not been investigated. The objective of the study was to evaluate the preventive effects of linolenic and linoleic acid on the induced lipotoxicity by palmitic acid in adult rat cardiomyocyte in order to propose a fatty acid in clinical approaches.

Materials & Methods: Ventricular heart muscle cells were isolated and seeded into 24-well-plates until 48h. Cells were treated with palmitic (0.5 mM), linolenic acid (0.5 mM), and linoleic acid (0.5 mM), palmitic+ linolenic acid + linoleic acid (0.5 mM+0.5 mM +0.5 mM) or left as control. TAG, DAG, DNA fragmentation and percent of viability were measured on times 24, 48.

Results: Result showed that linolenic and linoleic acid decreased DAG and DNA fragmentation and increased TAG when co-administrated with palmitic in compare to palmitic alone.

Conclusion: In conclusion, linolenic and linoleic acid prevented lipotoxicity of palmitic acid in adult rat cardiomyocytes.

Keywords: linolenic acid, linoleic acid, lipotoxicity, palmitic acid

Abstract No: 360

Effect of Captopril on Cyclophosphamide-induced Hemorrhagic Cystitis in Rats

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Abstract

Background: The aim of this study is to evaluate the effect of Captopril compared with Mesna for the prevention of Cyclophosphamide-induced hemorrhagic cystitis in rats.

Materials & Methods: Twenty five male Sprague-Dawley rats were equally divided into five groups. Group I received saline (10 ml/kg, i.p.), Group II received a single dose of Cyclophosphamide (200 mg/kg, i.p), Groups III-V received Mesna (40 mg/kg, i.p.), Captopril (20 and 40 mg/kg, i.p.) 30 minutes and 7 hours after administration of Cyclophosphamide, respectively. Histopathological evaluation of bladder, liver and kidney, also measurement of the levels of glutathione content and lipid peroxidation in the last two organs and alanine transaminase, aspartate transaminase, alkaline phosphatase, blood urea nitrogen and creatinine in serum were carried out.

Results: Captopril in both doses reduced the histopathological changes induced by Cyclophosphamide in comparison with Mesna. No significant difference in the activities of liver enzymes, the level of glutathione and lipid peroxidation of liver and kidney tissues and their architecture was observed among groups. Captopril had the ability to decrease the Cyclophosphamide-induced elevated blood urea nitrogen and creatinine levels.

Conclusion: The results of present study suggest that the co-administration of Cyclophosphamide and Captopril may have therapeutic potential to protect the Cyclophosphamide-induced hemorrhagic cystitis.

Keywords: Captopril, Cystitis

Abstract No: 550

The Protective Effect of Captopril on Diazinon-Induced Nephrotoxicity

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Abstract

Background: Diazinon is a synthetic organophosphorus acaricide and insecticide widely used for veterinary and agricultural purposes. However, its animal and human exposure leads to nephrotoxicity as a result of induction of oxidative stress. This study has been initiated to determine whether captopril, an angiotensin-converting enzyme (ACE) inhibitor containing sulfhydryl (-SH) group can protect against diazinon-induced nephrotoxicity.

Materials & Methods: The groups (six rats each group) were as follows: control, diazinon group and treatment group that received captopril 30 minutes before diazinon. After 24 hours, animals were killed, kidney tissue was separated and oxidative stress markers (ROS, lipid peroxidation, glutathione, and protein carbonyl and catalase activity) were measured.

Results: ROS, lipid peroxidation and protein carbonyl increased after diazinon exposure but was significantly decreased with captopril pre-treatment. Diazinon decreased the kidney levels of glutathione and catalase activity. Captopril significantly increased the levels of these two markers.

Conclusion: These results suggested that captopril prevented diazinon-induced oxidative stress and subsequently diazinon-induced nephrotoxicity.

Keywords: Captopril, Diazinon, Nephrotoxicity, Oxidative stress

Abstract No: 348

Protective effect of *Thymus vulgaris* extract against gentamicin- induced nephrotoxicity in rats

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Abstract

Background: Gentamicin is an effective drug against infections but nephrotoxicity and oxidative impairment are side effects of this drug. Various plants were attempted to improve gentamicin nephrotoxicity. *Thymus vulgaris* have shown strong preventive and therapeutic effects against different diseases. We supposed that *Thymus vulgaris* prevents of gentamicin toxicity by its antioxidative effects.

Materials & Methods: Three groups of rats were used. In group1, saline was administered daily. In group 2, gentamicin was administered. In group3, gentamicin was administered plus *Thymus vulgaris*. Estimation of blood urea nitrogen, serum creatinine concentration and renal tissue MDA contents were carried out after the last dose of *Thymus vulgaris*. Kidneys were also studied for histological changes.

Results: Gentamicin induced significant ($p<0.05$) increases in BUN and serum creatinine concentrations and renal MDA contents when compared with the control group. BUN, creatinine and MDA levels were reduced significantly ($p<0.05$) in the *Thymus vulgaris* plus gentamicin group when compared with the gentamicin group. Histological studies kidney of intoxicated rats group which received *Thymus vulgaris* showed reparative tendencies.

Conclusion: In conclusion, *Thymus vulgaris* prevents the toxic effects of gentamicin in kidneys.

Keywords: Gentamicin, nephrotoxicity

Abstract No: 371

Morphine modulates oxidative stress markers and antioxidant status in male rat brain

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Abstract

Background: In the current study, biochemical modifies with long term application of morphine in rat's brain were assessed.

Materials & Method: Twenty male Wistar rats (200–240 g) were involved and separated into two groups. Normal saline was given intraperitoneally in the control group (n = 10). Morphine group (n = 10) received morphine intraperitoneally at a dose of 5, 10, 15 mg/kg/day in the first, second and the third ten days of the study, respectively. Serum levels of alanine amino-transferase (ALT), aspartate aminotransferase (AST), lactate dehydrogenase (LDH) and brain malondialdehyde (MDA) activity as well as levels of catalase (CAT), glutathione-s-transfrase (GST), superoxide dismutase (SOD) and reduced glutathione (GSH) were studied.

Result: Serum levels of AST, ALT and LDH were significantly increased in the rats received morphine versus the rats received vehicle. The evaluation of MDA in brain showed that the MDA level was significantly upper in the morphine treated rats versus to the control rats ($P < 0.05$). The activities of CAT, GST, SOD and GSH were dramatically lesser in the morphine treated rats versus to the control rats. ($P < 0.05$).

Conclusion: Our investigation exhibited the risk of brain damage through the long term application of morphine by disturbance oxidant-antioxidant balance. While morphine is pointed to be effective in pain management, their toxic effects should be kept in mind during the chronic application.

Keywords: morphine, oxidative stress, brain damage, antioxidant

Environmental Toxicology I

Abstract No: 463

Pesticide Residues in Surface, spring and Ground Water in the province of Bushehr, Iran

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Abstract

Background: The growing population and increasing needs to agricultural products increased use of pesticides resulting in contamination of the environment, including water. The purpose of this study was to determination of pesticide residues in agricultural water resources in province of Bushehr in 2013.

Methods & Materials: Four water samples were randomly selected from different sources of local province of Bushehr and analyzed to determine the occurrence and distribution of organophosphorus, Organochlorine and carbamate pesticide residues by using high performance liquid chromatography (HPLC) and gas chromatography technique.

Results: It was found that out of 4 samples, three were found contaminated with pendimethalin, but none residue of diazinon, molinate, heptachlor, permethrin, DDT, permethrin, chlordane, simazine and dieldrin were detected in any of the tested samples. Different studies have shown that pesticides residue concentration in water sample have a relationship with the amount of pesticides used in an area, physical and chemical refractory properties of pesticides; and environmental conditions.

Conclusion: Thus, using resistant pollutants such as pesticides will be a serious threat to health of water consumers if they are not properly controlled.

Keywords: Pesticides, Drinking water resources, HPLC, GCMS, Bushehr

Abstract No: 542

Paraoxonase/arylesterase activity after acute chlorpyrifos poisoning.

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Abstract

Background: The paraoxonase 1 (PON1) is a high-density lipoprotein-associated esterase/lactonase, with antioxidant and anti-inflammatory activity. Also Paraoxonase 1 hydrolyze the active metabolites (oxons) of a number of organophosphorus (OP) insecticides such as parathion, diazinon and chlorpyrifos .It is a widely studied enzyme based on its protective role against poisoning by organophosphate (OP) insecticides and in vascular disease, as well as its use as biomarker of diseases involving oxidative stress, inflammation and liver diseases but little is known about PON1 activity status after acute organophosphate intoxication and the aim of present study is to investigate changes in serum PON1 activity after acute chlorpyrifos poisoning and its relation with acetylcholinesterase (AChE) activity.

Methods & Materials: Rats were treated with acute dose of chlorpyrifos (160mg/kg) and blood samples were taken before and 6 & 96h after treatment. Plasma cholinesterase, PON1 and arylesterase activity were measured by spectrophotometric methods. The OP poisoning signs such as miosis salivation, tremor, fasciculation and paralysis were observed after intoxication and AChE activity significantly inhibited (70 to 86 percent).

Results: All signs resolved after 48 h and AChE activity returned to baseline activity at 96h but PON1 and arylesterase activities progressively increased after treatment and significant differences were observed between 96h with 6h and baseline activities and also between 6h and baseline activity. Negative relation was observed between AChE activity and PON1 or arylesterase activity.

Conclusion: According this finding it is recommended that PON1/arylesterase activity is monitored after OP intoxication as a biomarker of intoxication.

Keywords: paraoxonase, arylesterase, Chlorpyrifos

Abstract No: 75

In-vitro measurement of lipid peroxidation induced by paraquat herbicide

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Abstract

Background: Lipid peroxidation is a process by which lipids undergo oxidation and can be catalyzed by free radicals. Paraquat is a bipyridilium herbicide and greatly used in Iran for controlling of weeds in gardens and can result in sever poisoning especially in child. Paraquat has been mentioned to have potential for inducing lipid peroxidation (LPO) in pulmonary system. Since in-vivo measurement of LPO level caused by parquat is somewhat difficult and may be overestimated and accordingly acquiring its efficient inhibitors are very limited. Therefore the study was aimed to measure in-vitro LPO levels induced by paraquat.

Methods & Materials: Paraquat, as soluble liquid form, at the concentrations ranged from 0.5 to 5000 ppm was applied to 0.5 ml of egg yolk homogenate (control). Lipid peroxidation induced by paraquat was then measured based on Dorman's method (1995) using thiobarbituric acid (TBA) reagent and also by assaying malondialdehyde (MDA) generation. Inhibitory effects of Vit-E on parquat induced LPO was finally determined.

Results: Analysis of LPO level by TBA showed that, paraquat could significantly induce LPO in yolk homogenates compared to control group ($P < 0.001$). The highest MDA formation was obtained at 5000 ppm concentration of paraquat which was equaled to 255.20 μM of MDA. Paraqate induced MDA formation was significantly inhibited in yolk by vit-E at concentrations more than 3 $\mu\text{g/ml}$.

Conclusion: it can be concluded that paraquat is able to induce LPO in yolk through MDA formation increase and by adapting this method its inhibitors such as natural antioxidants can be easily evaluated.

Keywords: Paraquate, lipid peroxidation, Malondialdehyde, Egg yolk

Abstract No: 90

Phytoremediation of Malachite Green from contaminated water using *Spirodella polyrhiza*

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Abstract

Background: In the last two decades, the huge growth in the textile dyeing and dyestuffs manufacturing industries has led to an immense increase in the volume and complexity of the waste water discharged to the environment. Biological methods like phytoremediation due to their cost effectiveness and environmental benignity were considered as a viable alternative to the known physicochemical processes.

Methods & Materials: In the present study the potential of *Spirodella polyrhiza* in biodegradation of Malachite Green was investigated and some physiological parameters such as plant growth, photosynthetic pigments content and the activities of some main antioxidant enzymes like peroxidase (POD), catalase (CAT) and superoxide dismutase (SOD) that can be involved in plant resistance to dyes and/or their metabolism were determined.

Results: According to the results, in treated plant with 20 mg/L Malachite Green the content of photosynthetic pigments was significantly decreased. Furthermore, according to the results the SOD, POD and CAT enzymes have very important roles in plants tolerance to the dye contaminations and the activities of these enzymes in the plant treated with different concentrations of the dye were increased.

Conclusion: Moreover, reusability experiments show the plant has reasonable potential in continuous removal of the dye from environment that confirms the role of plant enzymes in biodegradation of the contaminant. Using GC-MS, the produced intermediate metabolites in degradation pathway were indentified and the metabolic fate of the dye was predicted.

Keywords: Biodegradation, *Spirodella polyrhiza*, Antioxidant enzymes activity assay, malachite green

Abstract No: 80

The Ecofaunistics of Scorpions in north of Khuzestan Province

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Abstract

Backgroun: Scorpion sting is an important health problem in some regions of Iran especially in Khozestan, south-west of Iran. Therefore, it is necessary to become acquainted with the ecology and biology of scorpion's species in any area. The purpose of the present study is to determine the scorpions' biology and ecology in north of Khuzestan Province in order to present some preventive health and medical strategies against scorpionstinging.

Material & Methods: This study is a kind of descriptive and applied one which was conducted based on random cluster sampling method in north of Khuzestan Province, Iran. In so doing, 418 scorpions caught from April to August (2012) were grouped based on the hunting area and then transferred to the laboratory in separate bottles containing alcohol 70%. And finally, they were identified using the identification guide for Iranian scorpions.

Results: In general, 418 scorpion samples were caught from different zoogeographical areas in north of Khuzestan Province. They were four species of Hemiscorpius Lepturus, Androctonus crassicauda, Mesobothus eupeus, and Buthotus sulcyi. The greatest number of the collected scorpions was from north of Khuzestan Province they belonged to Androctonnus crassicauda (51%); and the fewest number belonged to Mesobothus eupeus (12%). However, the most abundant scorpions in both urban and rural areas belonged to Mesobothus eupeus (38%) and they had their most period of activity in June.

Conclusion: Considering the different species of the hunted scorpions, it is necessary not only to inform the public but also to educate them on how to take preventive actions against scorpion stinging.

Keywords: Fauna, scorpion, ecology, Khuzestan

Abstract No: 581

Occupational Exposure with Epichlorohydrine in a Petrochemical Complex in the Summer and Winter Seasons during 2014-2015

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Abstract

Background: exposure of the employees in the chemical industry with some of the volatile organic compounds over long periods of time may cause the irreparable effects on their health. The aim of this study was to evaluate the exposures of workers with epichlorohydrine released in the respiratory air in one of the country's petrochemical complexes.

Method & Materials: this study was a cross-sectional study that was conducted by the method of standard 1003, and 1503NIOSH in the chemical industry of petrochemical complex. After the measurement of epichlorohydrine a quantitative assessment of risk was done using the method devised by the United States Environmental Protection Agency (EPA). Furthermore, the statistical analysis of the data was performed using the SPSS19.

Results: the results of this research show the frequency of individuals with various risks in *exposure of* with epichlorohydrine in winter as follows: low-risk individuals (4); medium risk (18%); high risk (20%); too high risk is (58%); while in summer no case was seen. The results also

show that exposure of some people in the winter with epichlorohydrine has been over the country limit (OEL).

Conclusion: because the exposure of some workers with epichlorohydrine in the winter has been allowed too much, so, it seems that reduced exposure of people through appropriate control measures especially in winter is really necessary.

Keywords: Epichlorohydrine; Petrochemical industries; Volatile organic solvents, Control measure

Abstract No: 42

The scorpion venom contains insect and mammal selective toxins

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Abstract

Background: Apistobuthus sosane and Odonthobuthus bidentatus scorpions which 2 species belongs to Buthidae family have been collected and reported from Iran. In this study we investigated the venom of O. bidentatus and A.sosane scorpion to identify mammal toxic fractions.

Methods & Materials: After collecting scorpions, they were milked with electroshock technique and then the venoms was lyophilized .the LD50 of the venom was determined. In order to separate different fractions, the freeze dried venom was solubilized in distilled water and soluble venom was loaded on a chromatography column packed with sephadex G50 gel and the fractions were collected.

Results: Based on the results obtained in this study, it can be concluded that the venom of scorpion (Apistobuthus sosane) contains at least two mamelian toxins As27II with molecular weight 5.9 KD and As27III with molecular weight 6.4 KD.while Odonthobuthus bidentatus indicates purified toxins with molecular weight of O211 9.2KD , O213 8.6KD and O233 6.8 KD.

Keyword: scorpion, venom, fraction, Apistobuthus sosane, odontobuthus bidentatus, gel

The authors would like to thank Razi Vaccine and serum Research Institute for the financial support of this research.

Abstract No: 306

Epidemiology of Poisoning due to Agricultural Pesticides in Patients Referred to Arda bil City Hospitals

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Abstract

Background: Increasing population growth increases the demand for agricultural products and food. Nowadays, number of accidental or intentional poisoning among pesticide users is high due to lack of adequate familiarity with agricultural pest control and pesticide storage principles. The aim of this study was epidemiologic evaluation of poisoning due to pesticides in patients referred to Ardabil city hospitals in 2011.

Materials & Methods: This descriptive study has been conducted on 245 patients hospitalized in Ardabil city hospitals. Information on age, gender, residence place, job, marriage status, pesticide type, cause of poisoning, poisoning season, mental and physical diseases history, and clinical symptoms was collected through a checklist and analyzed by descriptive statistical methods such as table, graph and mean \pm SD using SPSS.16.

Results: 162 patients (66.1%) were female with the rest being male. The mean age of cases was 30.52 years and the most prevalent age group was 20-30 years with 89 cases (36.3%). The highest number of patients was admitted in summer season with 112 cases (39.7%) and the poisoning in 91 cases (77.95%) was intentional. 29.4, 42, 51.8, 86.9, 29, and 7.8% of cases were admitted with respiratory, neurological, ocular, gastrointestinal, cardiovascular, and renal symptoms. Aluminium phosphide with 86 cases (35.1%) was the dominant type of pesticide.

Conclusion: Regarding to pesticide poisoning mortality, financial burden, and morality; it is necessary to take educational measures to protect people against poisoning.

Keyword: Poisoning; Epidemiology; Ardabil

Abstract No: 595

An Overview of chemical warfare agent effects on Iran-Iraq war survivors' immune system

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Abstract

Background: Among the Weapons of Mass Destruction, chemical warfare (CW) is probably one of the most dangerous and brutal weapons made by mankind. Chemical warfare is an inexpensive weapon which its producing procedures are relatively easy. The CW agents possess different characteristics and belong to various classes of compounds which have portentous consequences. These agents are classified in these groups; nerve agents, vesicants (blistering agents), bloods agents, choking agents (pulmonary agents), riot-control agents (tear gas), psych mimetic agents and toxins. However, these weapons have many destructive effects on the human body, we just indicate its wreckful effects on the immune system. These agents can enter the body through various routes, including the skin, the respiratory system, eyes and nasal conjunctiva and the gastrointestinal system by contaminated foods. These can cause acute, delayed and chronic manifestations in patients. This substances leads to DNA damage, cell membrane loosing integrity, decreasing total leukocytes count, hypersensitivity against some antigens, caspase activation, bone marrow diseases, increasing apoptosis rate in leukocytes and other destructive effects on immune system function. The people who tainted by these agents may show different signs, some of these may be recurrent or be chronic. Base on several surveys which have done on Iranian and Iraqi survivors, the immune system of these people couldn't work properly and the risk of infection to viruses and microbes in these people are very high. According to medical reports on exposed cases that were examined by specialists, some of the survivors suffer from allergy problems, particularly in the respiratory tract, which may be related to IgA levels as well as other severe respiratory, dermatological and other complaints recorded in their medical reports. What is important about these patients is that, they should be monitored for the whole of their life and needs to improve their immune system function by some immune-stimulators drugs. The main conclusion of this review is that long-term effects were produced by chemical warfare agents on victims who have survived in Iran-Iraq war, in particular, on their immune system at both antibody and cell-mediated levels.

Conclusion: This confirms the immuno-suppressive property of chemical compounds, which may lead to the appearance of secondary opportunistic or pyogenic bacterial infections due to injuries which occurred during the attack and impaired immunity that has been frequently observed among chemical survivors.

Keywords: chemical warfare, immune system dysfunction, chronic effects

Abstract No: 556

Occurrence of Histamine in Canned Tuna Fish Produced of Khuzestan Province Manufactories Using HPLC Method

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Abstract

Background: Histamine is a degradation product of the bacterial decarboxylation of amino acid histidine. Histamine in seafood can cause histamine (or scombroid) fish poisoning (HFP). The aim of the present work was to determine of histamine concentration in canned tuna fish produced of Polak and Majid factories at Khuzestan province using HPLC.

Methods & Materials: tuna fish samples of each factory were collected. 20 ml of 1 mol/L HClO₄ was added to an adequate amount of each homogenized fish sample, vortex and then was placed in an ultrasound bath for 15 min; centrifuged; the supernatant was then drawn off and filtered through whatman filter into a 50 ml round bottomed flask and aliquot of internal standard (1, 1 – dimethylbiguanide hydrochloride) added to obtain 5mg/l concentration, was brought to volume with deionized water. Then, it was filtered through syringe filter and 20 µl of filtrate injected into HPLC equipped with column C18 (250 mm × 4.6 mm ID, 5µm) and UV detector at 214 nm. The mobile phase consisted of 85% (15% methanol +85% phosphate buffer solution at pH 6.9) and 15% acetonitrile at flow rate of 0.7 ml/min. LOD, LOQ method were 1mg/kg and 2mg/kg respectively.

Results: The mean concentrations of histamine in Polak and Majid tuna fish samples were 6.60825 and 7.1086 mg/L, respectively. The maximum level of histamine belonged to Polak tuna fish in 37.150 mg/L. Mean concentration of histamine in Majid and Polak Tuna fish samples were significantly lower than maximum tolerable level of histamine (30µg/g) set by the Institute of Standards and Industrial Research of Iran (ISIRI) and FDA.

Keywords: Histamine, Tuna fish, HPLC, 1, 1- dimethylbiguanide hydrochloride

Abstract No: 203

An investigation on the potential of different fruit/vegetable extracts in dissipating Malathion residues

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Abstract

Background: The ability of 5% extracts of some fruits and vegetables including bell pepper, tomato, cucumber, cantaloupe and carrot and also buffer (control) in dissipating Malathion was investigated.

Materials & Methods: Sample extracts and Trisma buffer (pH 7.4) (50 mL) were spiked in triplicate with malathion stock solution to make a final concentration of 0.2 mg/L and incubated at 37 °C for 4 h. At 0, 0.5, 1, 2, 3, 4 h after spiking, 10 mL of each solution was removed for analysis. Extraction and clean-up of the samples were performed using QuChERS method and the pesticide residues were analyzed by a Shimadzu LC9A HPLC equipped with a UV/VIS detector. According to the results, the dissipation trend of Malathion in the fruit/vegetable samples and buffer followed first-order double-exponential decay (FODED) and simple first-order kinetic (SFOK) models, respectively. The initial dissipation rate of Malathion in tomato (DT10=0.05 h), bell pepper (DT10=0.06 h) and carrot (DT10=0.07 h) was faster compared to the other samples.

Results: The slowest rate of pesticide decline belonged to cantaloupe (DT50=1.92 h) with a significant difference from the other samples ($p \leq 0.01$), whereas tomato (DT50=0.43 h) and carrot (DT50=0.53 h), showed the fastest dissipation rate. DT90 values derived from the models revealed no significant difference between the samples except for cantaloupe which had the slowest rate of dissipation (DT90= 8.27 h) with a significant difference from others ($p \leq 0.01$).

Conclusion: A direct relation was observed between protein content of the samples and the rate of Malathion decline which shows the possibility of enzymatic degradation of this pesticide in the extracts.

Keyword: Pesticide residues, Kinetic models, HPLC, Aqueous Extracts

Abstract No: 188

Effects of crude venom of the Iranian scorpion *Buthotus schach* on K-Channels neurons of brain in rat

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2-Department of physiology and pharmacology, Pasteur Institute of Iran, Tehran, Iran.

Abstract

Background: Understanding the Electrophysiological effects of toxins, may facilitate new drugs discovery. *Buthotus Schach* is one of the six dangerous scorpions in Iran. Scorpion venom contains of toxins and enzymes. Almost toxins of scorpion affects on ion channels. Ion channels are important roles on Action potential and excitability of neurons cell. Present study was aimed to investigate the electrophysiological effect of *Buthotus Schach* scorpion crude venom on K-channels in magnocellular supraoptic.

Materials & Methods: Rats were anesthetized with ether and decapitated, and brains were quickly removed and placed in ice-cold, oxygenated dissociation solution. Supraoptic were dissected and cut with a tissue chopper into 350- μ m-thick slices. The slices were incubated at 37°C for 1h, and then Current Clamp Recording was performed scorpion venom different concentration on determine intrinsic properties of magnocellular supraoptic.

Result: In before of Treatment cell group, the resting membrane of neurons (RMP); 53.74 ± 0.33 mV and Half Width Was 4.94 ms and Decay time 90% to 10% 4.29 ms. however, following extracellular application of *Buthotus Schach* crude venom shifted significantly decrease in the RMP in all concentration. However in all dose of crude venom Half Width increase significantly. Moreover just 3 and 10 μ g/ml dose of venom caused a significant increase in decay time 90% to 10%.

Conclusion: Finding demonstrated that crude venom of *Buthotus Schach* Scorpion suppressed the firing and neuronal excitability in spontaneously mode by interfering with ion channels function, possibly voltage-dependent K channels.

Keywords: Crude Venom, Iranian scorpion *Buthotus schach*, Ion Channel, Patch Clamp,

Abstract No: 185

The electrophysiological effects of the crude venom of the Iranian scorpion *Buthotusschach* on magnocellular supraoptic in rat

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Abstract

Background: *Buthotus Schach* is one of the six dangerous scorpions in Iran. Scorpion venom contains of toxins and enzymes. Almost toxins of scorpion effects on ion channels. Ion channel are important roles in Action potential and excitability of neurons cell. Present study is investigating the electrophysiological effect of *Buthotus Schach* scorpion crude venom on magnocellular supraoptic.

Material & method: venom. Lyophilized crude venom was obtained from Razi Vaccine and Serum. Crude venom (200 mg) was dissolved in 10 ml deionized water. The venom solution was dialyzed against deionized water for 48 h. Then the venom solution was centrifuged at 14000×g for 17 min to remove the insoluble material. The supernatant containing the solubilized venom was used for the study.

Whole cell patch clamp recording was performed scorpion venom different concentration on determine intrinsic properties of magnocellular supraoptic.

Results: In before of Treatment cell group, neurons had Action potential amplitude (APA) was 91.92 mV, Half Width Was 4.94 ms and Rise time 10% to 90% 3.11 ms. however, following Extracellular application of *Buthotus Schach* crude venom shifted significantly decrease in the APA in all concentration. However in all dose of crude venom Half Width increase significantly. Moreover just 10 µg/ml dose of venom caused a significant increase in rise time 10% to 90%.

Conclusion: Finding demonstrated that crude venom of *Buthotus Schach* Scorpion suppressed the firing and neuronal excitability by inferring with ion channels function, possibly voltage-dependent Na channels.

Keyword: Crude Venom, *Buthotus schach* Scorpion, Ion Channel, Whole Cell Patch Clamp

Abstract No: 472

Effect of TiO₂ Nanoparticles on survival and growth of two different Artemia species as Artemia urmiana and Artemia franciscana

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Abstract

Background: Among metazoan Artemia is only creature could tolerate high salinities. Artemia play an important role in aquaculture as live food as well and model organism in biological researches. Using of these kind of animals could give better view about the effect of Nanoparticles of living organisms. This particle smaller than 100 nanometer in size is known with toxic effect from one side which cause mortality and genetic changes in cells and also can stimulate the growth and survival of living creature if is used in proper condition. According to the research providing that the nanoparticle is been converted to organic nanoparticles not only toxic effect of these materials can be controlled but also it is possible to introduce new application for them. Since Artemia is used as live food for the other animals in food chain it is possible to accumulate the nanoparticles in Artemia in order to send to the intestine of bigger creatures after checking toxic effects on Artemia.

Methods & Materials: In present study at firstly TiO₂ nanoparticles was enriched and converted to organic Nanoparticles in Saccharomyces cerevisiae which used as food for rearing of Artemia urmiana and Artemia franciscana by the Couattue formula, 1992. Subsequently growth survival of the Artemia was checked during 15 days of experiment comparing to the control groups. For this several samples was taken in days 3, 7, 11 and 15 days by measuring growth and survival.

Results: According to the results CuO organic Nanoparticles could simulated growth and survival of Artemia providing to be selected in proper dosage. More over this particles had different effect on A.urmiana and A. franciscana species.

Keywords: Artemia, TiO₂, Nanoparticles, Growth, Survival.

Abstract No: 526

Automated preconcentration and analysis of pyrethroid pesticides residues by on-line hollow fibre liquid-phase microextraction_high performance liquid chromatography

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Abstract

Background: In this research, a rapid efficient and automated instrument based on hollow fiber liquid-phase microextraction (HF-LPME) followed by high performance liquid chromatography (HPLC) with UV-vis detection was applied for the preconcentration and determination of three pyrethroids (deltamethrin, fenpropathrin and fenvalerate) in soil samples.

Methods & Materials: n-Dodecane was used as the supported liquid membrane (SLM) and methanol was used as the acceptor phase in the hollow fiber lumen. The effects of different parameters such as fiber length, extraction time, and stirring rate on the extraction efficiency were investigated and optimized. The composition effect of SLM and type of acceptor phase were optimized separately. The automated instrument used in the research was consisting of automated syringe pump for loading the liquid membrane and acceptor solvents, a platform lift for moving the sample vial, and a sampling loop for on-line injection of the extract to HPLC instrument.

Results: Under optimized condition, the calibration curves were linear ($r^2 > 0.992$) in the range of 0.3–200 $\mu\text{g L}^{-1}$. LODs for all of the pyrethroids were obtained in the range of 0.07–0.18 $\mu\text{g L}^{-1}$.

Conclusion: The applicability of this technique was examined by analyzing pesticide residue in soil samples. The relative recoveries of the pyrethroids were in the range of 81.2–106.3% that show the capability of the method for the determination of the pesticides residue in soil.

Keywords: hollow fiber, microextraction, pesticide

Abstract No: 291

Synthesis of nano-sized diazinon-imprinted polymer and its application to the measurement of pesticide residues in agricultural products

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Abstract

Background: Organophosphate pesticides are used widely in agriculture, public health and domestic fields for controlling insects. Diazinon is an anti-cholinesterase organophosphate pesticide, which is commonly used against insects in agriculture and also for controlling silverfish, cockroaches, and ants in residential and commercial buildings. Diazinon functions as an acetylcholinesterase inhibitor. This study was carried out in order to measure the diazinon residue in agricultural products.

Materials & Methods: In order to prepare nano-sized MIP by suspension polymerization in silicon oil, 5mL of chloroform was mixed with 2.5 mmol of metacrylic acid and 1mmol of diazinon. The mixture was shaken for 10 min and after addition of 12.5 mmol of EGDMA, the shaking was continued again. When diazinon was completely dissolved, 0.01g initiator (AIBN) was added. The described mixture, was poured into silicon oil (60mL), purged previously with a stream of nitrogen gas for 15 min. Then, the polymerizable mixture was dispersed at 2000 rpm for 5 min. The mixture was then purged with nitrogen gas for 10 min. Polymerization was carried out in a water bath, fixed at 65°C, for 22 h. The conventional carbon paste was prepared by mixing 50 mg graphite power and 30 μ L paraffin oil.

Results: The electrochemical behavior of diazinon at the imprinted sensor was characterized by cyclic voltammetry and linear sweeping voltammetry. The imprinted films showed high selectivity toward diazinon in comparison to similar organophosphates. A linear response over diazinon concentration in the range of 0.015-15 mg kg⁻¹ was exhibited with a detection limit of 0.003 mg kg⁻¹ (S/N = 3).

Conclusion: In this paper a new electrochemical sensor for determination of diazinon was introduced. Application of MIP as a novel modifying agent in the carbon paste electrode made it very selective for diazinon determination in the presence of common potential interfering agents according to the specific recognition nature of the synthesized material.

Keywords: Diazinon, imprinted polymer, nano-sized, agricultural products

Abstract No: 260

Oxidative stress induction in earthworm following soil contamination with Diclofenac

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Abstract

Background: Pharmaceuticals present a potential threat to soil organisms. Diclofenac is a synthetic non-steroidal anti-inflammatory drug mostly used as an analgesic and antirheumatic. Diclofenac enters soil with excrement and urine. Bioaccumulation of diclofenac in the food chain has contributed to a decrease in the population of vultures. It remains in biological fluids for 11 hours. Yet in environment it undergoes photolysis under sunlight and its half-life is 39 minutes. Earthworms are ideal as non-conventional organisms for assessing biological risks from hazardous and toxic wastes in terrestrial environments. The aim of this study was to investigate the level of super oxide dismutase (SOD) as an oxidative damage index in the earthworms which was exposed to three doses of diclofenac.

Material and Methods: 35 earthworms, *Eudrilus eugeniae* were randomly divided into 4 groups (n= 7) as following: control and 3 sub lethal doses of diclofenac (25, 50, and 75 mg/kg soil) for a time span of 7 days. At the day of analysis, the earthworm were homogenized in cold KCl solution (1.15%) to give a 10% homogeny suspension and used for biochemical analysis. Super oxide dismutase SOD activity in earthworm homogenates was assayed using a method based on the ability of the enzyme to inhibit the autoxidation of pyrogallol. Data analysis was performed by using one way ANOVA.

Results: results showed that diclofenac in 3 doses significantly increased the level of SOD ($p<0.05$).

Conclusion: In this study, diclofenac was found to be toxic to *E. eugeniae* in different doses. It is widely accepted that the measurement of the biological effects of pollutants has become very important for the assessment of environmental quality. The basic consideration for the use of biomarkers is that living organisms provide the best reflection of the actual state of the ecosystem and of changes therein.

Keyword: Diclofenac, oxidative stress, earthworm

Abstract No: 218

Molecular analysis of pyrethroid insecticide resistance gene alpha-subunit in the human head louse

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Abstract

Background: Pyrethroid insecticides are widely used to the control of pediculosis, the human head louse infestation. Increasing resistance of head louse to pyrethroid pediculicides during the last two decades is responsible for frequently reported treatment failures.

Materials & Methods: In order to identify additional sodium channel mutations potentially associated with knockdown resistance, full-length genomic DNA of IIS5 subunit were amplified and sequenced from head louse populations collected from schoolchildren and who are seeking treatment in Health Centers in an urban area of Iran. DNA was extracted from individual lice and used to amplification and sequencing of a ~900-bp fragment to detect the kdr-type mutations. A total of 20 head lice were analyzed.

Results: Sequence analysis results were presented in Congress.

Conclusion: This was the first molecular survey on head lice pyrethroid resistance gene in Iran. Further studies are now required to evaluate the prevalence of the kdr-like mutant allele in head lice in Iranian populations.

Keyword: Pediculosis, kdr resistance, PCR, Sequencing, Iran.

Abstract No: 214

Physiochemical and biological differences between the venoms of Hemiscorpius lepturus and Hemiscorpius persicus scorpions

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Abstract

Background:

Materials & Method: In this study 500 Hemiscorpius persicus scorpions were hunted from South-eastern and 500 Hemiscorpius lepturus South-western parts of Iran. The scorpions were milked by electrical stimulation and the venoms were freeze dried. The average of 0.25 mg dry venom was obtained from each scorpion.

Results: The amount of soluble protein in the venom after removal of mucus was 96.4 ± 2.3 % of crude venom. The toxicity (LD50) of crude venom was 135.33 ± 6.25 µg for each 18-20 gr Albino mice. The SDS-PAGE of the venom revealed 12 proteinic bands with molecular weight ranging from 3.5 to 160 kilo dalton. Phospholipase activity of the venom was determined by using egg yolk as a substrate, found to be 122 unit/mg. the neutralization test was carried out by using Razi polyvalent scorpion antivenom which revealed that 2 mg/ml of antiserum was able to neutralize the Hemiscorpius Persicus venom equivalent to 15 LD50/ml. the immunodiffusion test of antiserum versus H.P venom showed some precipitation lines which confirms the effectiveness of Razi polyvalent scorpion antivenom against the venom of H.P scorpion.

Keywords: Hemiscorpius persicus, Hemiscorpius lepturus, venom, antiserum, SDS-PAGE, Phospholipase

Abstract No: 210

Biotransformation of Reactive Red X-GRL 41; Reactive Red 196; Reactive Red 141 and Reactive Red 120 dyes using *Saccharomyces Cerevisiae*

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Abstract

Background: *Saccharomyces cerevisiae* (baker's yeast) is the most important industrial microorganisms. Nowadays, industrial and chemical activities led to produce new compounds with new kinds of contamination in the environment. Discharge of untreated or partially treated industrial sewage has created the contamination problems of rivers and lakes such as drugs, oil, heavy metals, paints, pesticides and various chemical compounds in them. Hence, it is necessary to control and reduce the levels of these compounds in wastewater and bring them to permissible values.

Materials & Method: This study aims to study the bioconversion potential of commonly available *Saccharomyces cerevisiae* for the four textile dyes of Reactive Red X-GRL 41; Reactive Red 196; Reactive Red 141 and Reactive Red 120. Reaction mixtures for biotransformation of dyes included 25 mg/l dyes and 1% dried harvested cells of *S. cerevisiae* (bread's yeast) were tested.

Result: The results show that harvested cells of *Saccharomyces cerevisiae* are able to bioconvert these dyes. Biotransformation happened more than 99% for Reactive Red X-GRL 41 and Reactive Red 120. Reactive Red 141 and Reactive Red 196 were decolorized with 96% and 93 %, respectively at the room temperature after 72 hours.

Conclusion: We hope these data also can be used in chemical, pharmaceutical and biotechnological industries.

Keyword: *Saccharomyce Cerevisiae*, Biotransformation, Reactive Red dyes, Biotechnology, Environmental Toxicology

Abstract No: 24

Application of Solid Phase Microextraction followed by Chromatograph-Flame Ionization Detector for 1 Sampling and Analysis of Acetonitrile in Air

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Abstract

Background: Acetonitrile used as a solvent in manufactures and affects to central nervous system from inhalation exposure. The aim of this study was to develop a micro-solid phase extraction method for the determination of acetonitrile in the air matrix.

Materials & Methods: The sampling was performed with a small diameter fused silica fiber coated with a thin film of stationary phase and was subsequently desorbed and analyzed by gas chromatograph equipped with a flame ionization detector (GC/FID). The effects of laboratory and sampling parameters were investigated and applied to the determination of acetonitrile in air matrix. The Carboxen/PDMS as the coating fiber showed better analytical performances compared to the PDMS fiber.

Results: Analysis of the data by ANOVA test at a 0.05 level of accuracy showed that the peak area of the sampler was significantly affected by temperature and humidity so that the optimum temperature was 20°C and the optimum humidity was 35%. Besides, the limit of detection (LOD) and limit of quantification (LOQ) for acetonitrile in the GC system were 0.05 and 0.15 µg/ml, respectively. The solid phase microextraction (SPME) has been shown a suitable technique for sampling and analysis of acetonitrile in air.

Conclusion: There was a good correlation between the SPME and national institute occupational safety and health (NIOSH) 1010 method under the optimum conditions.

Keywords: Acetonitrile, Solid Phase Micro Extraction, Gas Chromatography

Abstract No: 149

Genetic damage in melamine dinnerware manufacture workers exposed to formaldehyde

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Abstract

Background: Melamine is an important chemical with the applications such as worktops, laminate floor, furniture, dinnerware, banknotes and automotive. Formaldehyde as a toxic chemical was released in the production of melamine dinnerware. Formaldehyde classified by the International Agency for Research on Cancer (IARC) in the group 1 (human carcinogen). Limited studies have been reported DNA damage in formaldehyde respiratory exposure. We evaluate DNA damage of workers who occupationally exposed to formaldehyde in some melamine dinnerware manufacture.

Methods & Materials: A case-control study was performed in 54 subjects from 4 melamine dinnerware workshops occupationally exposed to formaldehyde. Age, sex, smoking habits and socioeconomically statue was matched in controls (n=34) from workers who were not occupationally exposed formaldehyde or any other physical or chemical hazardous compounds. Alkaline comet assay in peripheral blood lymphocytes were used to determine DNA damage in subjects. The results are expressed as means \pm standard deviation. Statistical analysis was performed using the SPSS 16.00 software.

Results: No significant difference was found between DNA tailing length, sex and smoking habit in assessed workers ($P > 0.05$). Tailing length was significantly higher ($P < 0.001$) in exposed group (35.26 ± 18.25) when compared with controls (22.13 ± 15.69). DNA damage in three job groups (pressing, polishing, packaging) was assessed. There are not significant differences between groups.

Conclusion: Overall, the results suggest that occupational exposure to formaldehyde in respiratory absorption because DNA damage in peripheral blood lymphocyte.

Conclusion: This information may be used to assess the health risks for exposed workers.

Keyword: Formaldehyde, DNA damage, comet assay, melamine dinnerware

Abstract No: 6

Evaluation of electrochemical biosensors in detection of Polycyclic Aromatic Hydrocarbons (PAHs) in Urmia water resources

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Abstract

Background: Due to population growth in recent decades and the country's economy dependence on oil production and the lack of logical structure and increasing consumption of fossil fuels has threaten environment and groundwater sources in industrial poles seriously. Among these pollutants polycyclic aromatic hydrocarbons (PAHs) which are noted as carcinogenic and mutagenic, which are the main pollutants I aquatic environments. These compounds contaminating waters directly or indirectly by contamination of aquatics can enter human food chain and be dangerous. Some of these pollutants under ultra violet light, oxidizing agents or during metabolism can be converted to active compounds which can covalently bind to proteins, DNA or RNA and produce carcinogenic intermediates. Therefore, detection of these pollutants by a sensitive and inexpensive method is very important. So an electrochemical DNA biosensor is used to detect PAHS due to its sensitivity, ability and high response rate.

Materials & Methods: To evaluate its performance the response of biosensor to real samples is compared with conventional method of determination of these pollutants (liquid- liquid chromatography). Electrochemical DNA biosensor is based on the difference between the electrochemical response of guanine bases in DNA structure in the presence and absence of PAH compounds.

Results: Under optimal conditions the biosemnsor detection four main PAH compounds such as antheracene, phenanteren, pyrene and bena[a]anthracene is in an acceptable linear range. The dection limit of biosensor for pollutants listed below is 0.05, 0.02, 0.1 and 0.05. This detection system has good sensitivity and reproducibility.

Keywords: Polycyclic Aromatic Hydrocarbons, water

Abstract No: 449

Farm location affects hematological, anti-oxidative and selected serum parameters in cultured rainbow trout

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Abstract

Background: Agricultural pesticides are the most important polluted pond ecosystem. Health of the aquatic can be a useful index for monitoring surface water pollution. The purpose of this study is examining the impact of the location of fish ponds and water source on the health of farmed fish. Health of fish are examining by measuring biochemical parameters, hematological and oxidative.

Methods & Materials: a total of 66 blood samples were taken from three rainbow trout farms in Fars province in Iran, in which the farm products offered to the market. These aquaculture ponds were different with regard to water supply source and position of pond construction, the distance from agricultural land, industrial and residential centers. The obtained blood samples were under evaluation of biochemical (alanine transaminase (ALT), aspartate transaminase (AST) and lactate dehydrogenase (LDH)), hematologic (hemoglobin (Hb), hematocrit (HCT) and differential white blood cell count) and oxidative (glutathione peroxidase (GPX) and superoxide dismutase (SOD), data were analyzed using one way anova.

Results: the measurement of biochemical parameters (ALT, AST, LDH) showed statistically significant differences in the levels of this enzyme exists in three fields ($p < 0.05$). In Hematologic studies, the amount of Hb, HCT were statistically significant differences ($p < 0.05$). The differential white blood cell count, frequency percentage, lymphocytes, monocytes and eosinophils in three fields were statistically significant ($p < 0.05$). The oxidative enzymes SOD were only statistically significant different ($p < 0.05$), but the fish farm in GPX was not statistically significant different.

Conclusion: the location of fish pond can be very effective in the health of aquatic. With the right policy the risk of exposure to the hazardous agricultural pesticides can be reached to a minimum level and supply the consumers with the healthy food.

Keywords: rainbow trout fish farming, agricultural pesticides, and environmental pollutants

Abstract No: 432

Assessment of ochratoxin A in cereals West Azerbaijan region of Iran

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Abstract

Background: Ochratoxin A (OTA) is a mycotoxin produced by several fungal species from *Aspergillus* and *Penicillium* genera. It is widespread in food and feed and its occurrence has been reported in cereals, cereal-derived products, dried fruits and spices. In Iran, a clear correlation has been established between the consumption of OTA contaminated food and the induction of specific pathologies. Thereby, OTA was detected in human blood and tissues. The aim of our study was to investigate the presence of OTA in widely consumed cereals commercialized in Iran.

Methods & Materials: The analytical methods used in our study involved the extraction of OTA by acidified toluene, immunoaffinity (IAC) clean-up and HPLC quantification with fluorescence detection. Levels and percentages of OTA contamination in different types of cereals, 110 wheat, 103 barley, 113 sorghum and 96 rice samples, were evaluated with incidences of 38%, 40%, 38% and 28%, respectively. The average of contamination by OTA found were 55, 96, 44 and 117 µg/kg, respectively, for wheat, barley, rice and sorghum.

Results: Our results showed that contamination percentages and levels in the period from 2012 to 2013 were higher than usual norms (5.0 µg /kg OTA) established by the European commission in 2002. The present report is the first one ever carried out on the natural occurrence of OTA in cereals, largely consumed by the Iranian population.

Keywords: Ochratoxin A, Cereal, Contamination, West Azerbaijan

Abstract No: 414

In silico mutation of Fragaceatoxin C as a candidate against HL60 cell line

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Abstract

Background: Fragaceatoxin C (FraC) from the venom of the sea anemone *Actinia* belongs to the actinoporins family of pore-forming toxins (PFTs). The toxic property of FraC relies on creating holes within biological membranes that results in lysing and death of cells. Taking advantage of this property as promising therapeutic potential, most kinds of cancer could be rooted out. In the present study using in silico methods, Fragaceatoxin C evaluated and mutated as a candidate for killing HL60 cell line. Since the binding of Fragaceatoxin C is based on recognition of sphingomyelin molecules on membrane, it targets not only cancer cells but also other kind of cells.

Methods & Materials: In the first step in order to preclude binding of this protein to intact cells, residues that play a basic role in sphingomyelin binding such as Tyr-111 replaced by other amino acids. In the second step in regard to principles on epitope insertion IELLQAR peptide tag that addresses proteins to HL60 cell's surface receptor was inserted in C-terminal. 3D structure of new chimeric protein sequence was predicted using homology modeling and then docking tools were used for studying interactions of this modeled protein with sphingomyelin.

Results: Results showed that all of changes that were applied on amino acid sequence of Fragaceatoxin C had no effects on oligomerization and pore-forming property of this protein, whereas sphingomyelin-specific membrane binding replaced by receptor-specific membrane binding.

Conclusion: It can be conclude that in-silico studies is able to predict the structural and functional alterations of therapeutic proteins which certainly in turn needs to be experimentally evaluated.

Keywords: Fragaceatoxin C, In-silico, Pore-forming toxins, Homology modeling

Abstract No: 407

Chlorpyrifos toxicity in primary cerebellar granule neurons culture: the role of NMDA, nicotinic and muscarinic receptors

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Abstract

Background: Chlorpyrifos is the well-known organophosphorus (OP) pesticide widely used as insecticide. The main toxicity of Chlorpyrifos is related to irreversible inhibition of acetylcholinesterase (AChE) in central cholinergic synapses however, chlorpyrifos can have deleterious effects on the nervous system through a variety of mechanisms such as oxidative stress and excitotoxicity. Nevertheless the exact mechanism of Chlorpyrifos -induced neurotoxicity is unclear. The aim of this study was to investigate the role of NMDA, nicotinic and muscarinic receptors in Chlorpyrifos-induced neurotoxicity in primary cerebellar granule neurons (CGNs) culture.

Methods & Materials: CGNs were cultured following standard protocol. After seven days in vitro (DIV 7) cells were incubated with different concentrations of Chlorpyrifos (100-1000 μ M) for 24 h. Also CGNs were exposed to Chlorpyrifos (200 or 300 μ M) in combination with Scopolamine (300 μ M) or Mecamylamine (2 μ M) or Memantine (100 μ M) and then cell viability was measured by MTT assay.

Results: The result indicated that cytotoxic effect of Chlorpyrifos on CGNs was concentration dependent. Memantin could not protect chlorpyrifos-induced toxicity on CGNs but Mecamylamine and Scopolamine had protective effect.

Conclusion: The protective effect of Mecamylamine was more than Scopolamine. These findings suggest that cytotoxic effect of Chlorpyrifos on CGNs is independent of NMDA receptors and cholinergic receptors are involved. Among the cholinergic receptors it seems that the role of nicotinic receptors is predominant.

Keywords: Chlorpyrifos, NMDA, cholinergic, receptors:

Abstract No: 374

Animal bite incidence in the County of Shush, Southwestern Iran

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Abstract

Background: Animal bites are a significant threat to human health because of fatality of subsequent infections such as rabies. The aim of this study was to determine the epidemiology of animal bites during a five-year period in Shush County.

Materials & Method: In a descriptive cross sectional study, all cases of animal bites referred to the health centers in Shush County were investigated during 2004-2008. The necessary data were recorded on the special questionnaire that contains questions about bite animal, age, sex, occupation, treatment, the bite site on the body and so forth.

Results: Out of a total of 2283 cases, 1771 people (77.6%) were male .Most cases were related to age groups 10-20 (33.4%). The average incidence rate of animal bite during these years was determined as 2.82 cases per 1000 people. Almost 86.5% and 13.5% of the cases occurred in rural areas and urban areas, respectively. Nearly 30% and 20.4% of cases were students and farmers, respectively. A total of 2155 (94.4%) and 86 (3.8%) bites occurred by the dog and cat, respectively. The greatest bite place on the body was in the feet (81.4%). During the study period, 2162 cases (94.7%) were treated with an incomplete regimen, and 120 cases (5.3%) were treated with a complete regimen.

Conclusions: Because the cost of prevention after biting for the health system is high, so, preventive programs must be concentrated on public health instruction, particularly in villagers, students, farmers and the owners of the domestic animals.

Keywords: Animal Bite, Incidence Rate, Rabies, Iran

Abstract No: 370

Effects of quercetin and resveratrol on zinc chloride– and sodium metavanadate– induced passive avoidance memory retention deficits in male mice

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Abstract

Background: Quercetin and resveratrol as found in a variety of fruits and vegetables have several biological and pharmacological properties.

Materials & Method: In this study, the effects of quercetin (50 mg/kg, i.p.) and resveratrol (50 mg/kg, i.p.) on zinc chloride (75 mg/kg/d, 2 weeks oral gavage) and sodium metavanadate (22.5 mg/kg/d, 2 weeks oral gavage) in step-through passive avoidance task were investigated. Zinc chloride was dissolved in saline and sodium metavanadate was dissolved in animal's drinking water. Time course (single, double and triple) i.p. administration of quercetin and resveratrol were done every other day on days 14th; 12th and 14th; 10th, 12th and 14th of zinc chloride and sodium metavanadate two weeks oral treatments. At the end of each part of studies, animals were trained for one day in step-through passive avoidance task. The avoidance memory retention alterations were evaluated 24 h, 48 h, 96 h and 168 h later to training session. Zinc chloride and sodium metavanadate oral gavage for two weeks decreased latency time in comparison with corresponding control groups.

Result: Finally, findings of this research showed that quercetin and resveratrol (50 mg/kg, i.p.) prevented zinc chloride- and sodium metavanadate- induced avoidance memory retention impairments and also did not cause any significant alterations on muscle strength of all treated mice in rotarod task.

Conclusion: There were not significant differences between single, double and triple doses of quercetin or resveratrol.

Keyword: Resveratrol, Quercetin, Zinc chloride, Sodium metavanadate, Step-through task

Abstract No: 358

Determination of lead and cadmium concentration in offered edible button-like fungi in Hamedan

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Abstract

Background: Heavy metal contamination of food products that caused by industrial activities is one of the most important risks that treats natural ecosystems and human. Edible fungi as a worth herbal origin full protein food is favored by consumers worldwide. The present study determined lead and cadmium concentrations in offered edible button-like fungi in Hamedan.

Materials & Method: 60 samples of edible button-like fungi were collected from the local super markets in Hamedan, Iran. Humidity percent of samples was measured and then with the ash of samples obtained by electrical furnace in 550 C°. Obtained ash dissolved by 1 ml concentrated nitric acid. Flaming atomic absorption used for determination of lead and cadmium concentrations.

Results: The average of lead and cadmium concentrations in samples was 0.7 ± 0.08 and 0.01 ± 0.008 mg/kg, respectively. The detected contents of lead and cadmium elements were lower than standard limits of WHO in edible fungi.

Conclusion: It is concluded that lead and cadmium concentrations in offered edible button-like fungi in Hamedan aren't worrisome

Keyword: Heavy metal contamination, Industrial activities, Flaming atomic absorption, edible button-like fungi

Abstract No: 565

A assessing antibacterial effects of a purified peptide derived from Naja naja snake venom

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Abstract

Background: Alongside endless scientific efforts in discovering new antibiotics and worldwide usage of these products, bacterial genomic change and characteristics have reduced antimicrobial agents' effectiveness and caused antibiotic resistance. These events forced scientists for further investigations in natural resources in order to find newer antibiotics. Venoms are formed from several peptide and non-peptide substances with various activities and nowadays, investigators are especially interested in antibacterial effects of such venoms. Although a number of venoms and their derivatives had some antimicrobial effects in different studies, many of these potentially potent components still remained unevaluated.

Materials & Methods: In this study, we evaluated the antibacterial effects of Naja naja (kind of cobra snake) venom on 2 bacterial species (Staphylococcus aureus: ATCC 6538, Bacillus subtilis: ATCC 6533) with minimum growth inhibitory concentrations (MIC) with micro plate method. And results were compared with ciprofloxacin and gentamycin antimicrobial roles.

Results: Study result showed that peptide which is driven from Naja naja venom has antibacterial effects against gram-positive bacteria.

Keywords: antibiotics, Naja naja snake venom, bacterial resistance

Abstract No: 354

Assessment of trace metals and nitrate in mineral water of markets and water resources, by Using Differential Puls Polarography (DPP) Arak, 2014.

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Abstract

Background: Since the second part of 20th century, there has been growing concern over the miscellaneous effects of heavy metals on human and aquatic ecosystems. Environmental influence of heavy metals was earlier mostly attributed to industrial sources. Heavy metals and Nitrate are compounds that can enter the water sources through different ways. The accumulation of heavy metals in body can lead to chronic illness and cause potential damage to the population. In this study cadmium (II), copper (II), lead (II) and zinc (II), Nitrate levels of mineral water in markets and water resources of Arak are determined by Differential Puls Polarographic (DPP) method and its comparison with national and international standards.

Materials & Methods: This cross-sectional study was done in summer and autumn 2014, samples were collected from different points of urban drinking water network (16) according to the standard methods. Data were analyzed by SPSS and One-way ANOVA, One sample t- test on the significant level $p < 0.05$.

Result: The findings resulted from the investigation of samples and their comparison with standard levels showed that the average Concentration of Cd, Pb, Zn, Cu and nitrate of mineral water of markets were 0.011, 0.3070, 37.65, 0.3890, 7.70 mg/ liter respectively. Average Concentration Cd, Pb, Zn, Cu, nitrate of water resources were 0.001, 0.237, 22.65, 0.5645, 9.45 mg/ liter respectively.

Conclusion: Our study showed concentration of trace metals (Pb, Cd, Cu, Zn) and Nitrate in drinking water of Arak is lower than standards levels. We suggested further studies to determine the levels of pollutants in the water around industrial areas of Arak. It also seems determination of heavy metal and nitrate by polarography is fit and proper. So this method for determination of pollutants water could be used instead of the atomic absorption spectroscopy.

Keyword: Trace metals, Water, pollutants, polarography

Abstract No: 349

Comparison of Azadirachtin content in neem seeds collected from four different parts of the Persian Gulf

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Abstract

Background: Azadirachtin is an important secondary plant metabolite with high bioactive properties found in seed kernels of the neem tree, *Azadirachta indica* Juss. It is a limonoid, tetranortriterpenoid compound that mimics the insect molting hormone Ecdysone and hence is used to control insect pests. Its mode of action is through feeding inhibition (detergency) and blocking the ecdysone. Biosynthesis of this compound in neem tree is a matter of gen by gen coevolution between plants and insects.

Materials & Methods: Neem tree, *Azadirachta indica* from the family Meliaceae is a miraculous tree with many uses in industry, agricultural, environment, phytoremediation, agroforestry, cosmetics, health sector and ecotourism. Azadirachtin the natural insecticide derived from neem seed kernel now is used worldwide against many important agricultural pests. I introduced the neem tree from the Persian Gulf to the World more than 22 years ago from Qeshm and Kish Island. This research is a part of a recently going project on the neem tree with the Petrozone of Iran. The objective of this part of the research is comparison of Azadirachtin content in neem seeds collected from four different parts of the Persian Gulf. Neem tree seeds were collected from Konarak, Sirri Island, Kish Island, Bandar Abbas and Bushehr in summer 1992. One Kg of each was kept in freezer with -20 Celsius for Azadirachtin content determination and the rest used for other parts of the project. 1 mg Azadirachtin standard were purchased from the company MehrAnalyse and after extraction, Azadirachtin contents of each seeds were determined by HPLC in toxicological lab of the plant medicine institute of the Ministry of agriculture.

Results: After extraction, HPLC analysis of the amount of Azadirachtin in NSK of Konarak, Sirri Island, Kish Island and Bandar Abbas and a One-Way ANOVA statistical analysis, no significant difference in means was observed.

Keywords: Neem tree, Azadirachtin, Persian Gulf, Natural insecticide

Environmental Toxicology II

Abstract No: 428

Evaluation of Anti-Angiogenesis effect of Iranian Agkistrodon Halys Venom

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Abstract

Background: Angiogenesis is a complex processes that is necessary for developing the new capillaries from pre-existing vessels and plays a critical role in a variety of normal physiological & pathological events.

Methods & Materials: We investigated the anti-angiogenesis effect of Agkistrodon Halys purified protein using the in vivo chick chorioallantoic membrane (CAM) assay and in vitro tube formation assay of human umbilical vein endothelial cells (HUVECs). The anti-proliferative activity of A. Halys purified protein was also examined by MTT assay. The purified protein of A. Halys on HUVEC showed cell viability reduction in a concentration- dependent manner. The in vivo CAM assay also showed the inhibition of new vascular formation when the chick embryos were treated to 1, 5, 13 µg/ml of A. Halys but this effect is not dose- dependent manner. In vitro tube formation assay of HUVECs could not inhibit the capillary tube formation. The purified toxins of A. Halys venom exert an effect on cultured HUVECs led to cell detachment and increased cell inhibition.

Results: Our results show A. Halys has no anti-angiogenic activity. Further study need to be done with other toxins of this species for the evaluation of their anti-angiogenic effect

Keyword: anti-angiogenesis, snake venom, CAM assay, HUVEC

The work was financially supported by research grant from the Shahid Beheshti University of Medical Sciences, School of pharmacy, Deputy of Research

Abstract No: 46

Evaluation of isocyanates in car painting workshop

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Abstract

Background: Presence of different aerosol and gaseous pollutants in the workplace not only endangers health of employees and increases occupational diseases but also affects negatively the healthy environment. The purpose of epidemiological studies on isocyno-compounds is determining the level of exposure of workers of industrial workplaces such as auto-body painting workshops to those pollutants in order to indentify high-risk occupations.

Methods & Materials: The study was made in automobile body repair and painting workshops. Samples of air were taken by single sampling pump and absorbing solution. The samples were analyzed by high-performance liquid chromatography (HPLC). The results were analyzed through using Pearson coefficient of correlation, Spearman correlation coefficient, one-sided variance analysis, Amended Welch Analysis of variance, and Games-Howell post-hoc test. The concentration of TDI (11.54 mg/m³) was lower than the permitted level in none of the workshops in which measurement was made, but the level of MDI was lower than permitted level only in 8.7% of the workshops. Pressure applied against Iran by sanctions has lowered the quality of paints too.

Results & Conclusion: The study showed significant difference between the workshops lacking any ventilator and those enjoying artificial ventilation. However, this difference was much eye-catching between the workshops lacking any ventilator and those enjoying natural ventilation.

Keyword: isocyanate, occupational, health, TDI, MDI

Abstract No: 551

The Protective Effect of Captopril on Diazinon-Induced Neurotoxicity

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Abstract

Background: Diazinon, an organophosphate insecticide, has been used worldwide in agriculture and domestically for several years, which has led to neurotoxicity as a result of induction of oxidative stress. This study has been initiated to determine whether captopril, an angiotensin-converting enzyme (ACE) inhibitor containing sulfhydryl (-SH) group can protect against diazinon-induced neurotoxicity.

Methods & Materials: We had six rats in every group including control, diazinon and treatment that received captopril 30 minutes before diazinon. After 24 hours, animals were killed, brain tissue was separated, isolated and oxidative stress markers (ROS, lipid peroxidation, glutathione, protein carbonyl and catalase activity) were measured. ROS, lipid peroxidation and protein carbonyl increased after diazinon exposure but was significantly decreased with captopril pre-treatment.

Results: Diazinon decreased the brain levels of glutathione and catalase activity. Captopril significantly increased the levels of these two markers.

Conclusion: Captopril is shown to be promising candidates for use in the suppression of neurotoxicity of diazinon.

Keyword: Captopril, Diazinon, Neurotoxicity, Oxidative stress

Abstract No: 51

Mercury and vanadium concentration in Cynoglossus arel fish in Musa estuary, Persian Gulf

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Abstract

Background: Musa estuary is located in the northern coastal area of Persian Gulf and has a semi-enclosed ecosystem surrounded by several industries. All wastewater from Industrial and residential cities is entered into this estuary. Heavy metals are as important ingredients in oil pollutants and industrial wastewater. Fish in human diet is considered to be an efficient exposure agent of environmental pollutants for humans. The aim of this study was to determine the concentrations of mercury and vanadium in Cynoglossus arel fish with 15 days interval period of fishing in Musa estuary.

Methods & Materials: 67 Cynoglossus arel fish were randomly selected from different points in Musa estuary during 5 intervals of 15 days in summer 2013. Biometric measurements have been conducted and the concentrations of mercury and vanadium were measured in muscle tissue of fish using direct method analyzer (DMA) and Graphite furnace atomic absorption spectrophotometer respectively.

Results: The mean concentration of vanadium and mercury in muscle tissue of Cynoglossus arel fish was 1.431 ± 1.526 and 0.9704 ± 0.486 mg/kgw.w. A reverse association was found between concentrations of mercury and vanadium. The GLM analysis showed a positive significant relationship between mercury and vanadium concentrations and length and weight ($P = 0.000$) of fish.

Conclusion: Mercury concentration exceeded the allowable standards of EPA, WHO and FDA in Cynoglossus arel although there was no standard limitations available to compare the values of

vanadium concentration determined in this study, these values were higher than those reported in the other studies. Therefore, it is suggested to cautiously consume *Cynoglossus arel* in Musa estuary based on dietary guidelines.

Keyword: Mercury, Vanadium, *Cynoglossus arel* Persian Gulf, Musa estuary.

Abstract No: 71

**The comparative of purification toxins from *Odotobuthus bidentatus*,
Lourenco et pezier 2002 and *Apistobuthus sosane* venom (scorpions,
Buthidae)**

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Abstract

Background: The scorpion venom contains insect and mammal selective toxins. *Apistobuthus sosane* and *Odonthobuthus bidentatus* scorpions which 2 species belongs to *Buthidae* family have been collected and reported from Iran. In this study we investigated the venom of *O. bidentatus* and *A.sosane* scorpion to identify mammal toxic fractions.

Methods & Materials: After collecting scorpions, they were milked with electroshock technique and then the venoms was lyophilized .the LD50 of the venom was determined. In order to separate different fractions, the freeze dried venom was solubilized in distilled water and soluble venom was loaded on a chromatography column packed with sephadex G50 gel and the fractions were collected.

Results: Based on the results obtained in this study, it can be concluded that the venom of scorpion (*Apistobuthus sosane*) contains at least two mammalian toxins As27II with molecular weight 5.9 KD and As27III with molecular weight 6.4 KD.while *Odonthobuthus bidentatus* indicates purified toxins with molecular weight of O211 9.2KD , O213 8.6KD and O233 6.8 KD.

Keyword: Scorpion, venom, fraction, *Apistobuthus sosane*, *odontobuthus bidentatus*, gel

Abstract No: 130

Study on the components of toxic fractions isolated from scorpion (Buthidae: Mesobuthus tumulus) toxin

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Abstract

Background: Mesobuthus tumulus belongs to Family Buthidae that is native of India. The venom of scorpions especially Buthidae is composed of different biological active components such as types of toxins. These toxins effect on the ion channels in body of insects and mammals. To study on toxic components in the scorpion venom must purify so in this study toxic fractions of scorpion venom was isolated and the most toxic of them were purified.

Materials & Methods: The toxic components of scorpion (Mesobuthus tumulus) venom was isolated by using gel -filtration chromatography on sephadex G-50 column in equilibrium with Ammonium Acetate buffer 20mM PH=7.4. Then the components of the most toxic fractions were isolated by chromatography of caution ion change and were confirmed purification of them by electrophoresis.

Results: 816 mg crude venom protein was poured on sephadex G-50 column, and then 815 mg proteins obtained in 6 isolated fractions. The toxicity of all fractions was tested on mice and observed fractions III and IV have toxic effect and LD50 of them are 0.4 and 0.46 mg/kg, respectively. Fraction III due to the low LD50 was applied on the 25-C CM-sephadex column equilibrated with 20 mM ammonium acetate buffer and PH =7.4. In this stage fraction III was separated to 20 sub-fractions and to survey their toxicity on mice was found the sub-fractions III14 to III19 had toxic effect. Of 250 mg protein of fraction III that was applied on the column, 242.75 mg (97%) was obtained in separated sub-fractions. Sub-fraction III14 again on CM-25-C sephadex column equilibrated with 20 mM ammonium acetate buffer and PH =6 was applied.

Conclusions: In this stage three purified toxins was obtained. Toxins III14.4 with LD50=0.11 mg/kg body weight of mice had the highest toxicity. For further research, these toxins could be used for preparation of antiserum or physiological effects.

Keyword: Mesobuthus tumulus, Venom, Chromatography, Toxin

Abstract No: 139

Methanolic Extract Of Sea Cucumber Obtained From Persian Gulf, *Holothuriaparva* Induces Cell Apoptosis Through Mitochondria In Human Chronic Lymphocytic Leukemia Cells.

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Abstract

Background: Natural products isolated from marine environment are well known for their pharmaco-dynamic potential in diversity of disease treatments such as cancer or inflammatory conditions. Sea cucumbers are one of the marine animals of the phylum Echinoderm and the class Holothuroidea, with a leathery skin and gelatinous body. Many studies have shown that the sea cucumber contains antioxidants and anti-cancer compounds. Chronic lymphocytic leukemia (CLL) is a disease characterized by the relentless accumulation of CD5+ B lymphocytes. CLL is the most common leukemia in adults, about 25–30% of all leukemias.

Materials & Method: In this study B lymphocytes mitochondria (cancerous and non-cancerous) were obtained using differential centrifugation from peripheral blood subjects and mitochondrial reactive oxygen species (ROS) production, collapse of mitochondrial membrane potential (MMP) and mitochondrial swelling was examined by fluorescence spectrometer following the addition of *Axinella sinoxea*.

Result: Our in vitro results with ONLY cancerous BUT NOT normal non-cancerous group mitochondria revealed significant ($P < 0.05$) increase in mitochondrial ROS formation, MMP collapse, and mitochondrial swelling and cytochrome c release after addition of different concentrations of *Axinella sinoxea*.

Conclusion: These results showed that *Axinella sinoxea* total methanolic extract has a selective toxicity on chronic lymphocytic leukemia mitochondria and hence may be helpful in the treatment of CLL.

Keyword: Sea cucumber, *Holothuriaparva*, Mitochondria, Chronic Lymphocytic Leukemia

Abstract No: 202

A comparison between two kinetic models in predicting diazinon dissipation trend on table grapes

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Abstract

Background:

Materials & Methods: In this study, first-order double-exponential decay (FODED) and first-order kinetic (SFOK) models were used and compared for predicting diazinon dissipation pattern in grapes. Following application of diazinon at the recommended dosage (0.9 g a.i. L⁻¹) and twice the recommended dosage (1.8 g a.i. L⁻¹) with three replications, representative samples were taken at certain intervals after the spray. The residues were extracted by a mixture of water/methanol/acetonitril (1:1:1, v/v/v) and injected into a GC-NPD apparatus. The dissipation results were fitted to FODED and SFOK models. Normalized root mean square error (NRMSE), coefficient of the residual mass (CRM) and Akaike information criterion (AIC) were obtained to measure goodness of fit for the fitted values for each model.

Result: According to the results, both SFOK and FODED models at recommended and double the recommended dosages were statistically significant ($P < 0.01$). The SFOK model ($r^2=0.63$, RMSE = 0.8242, CRM = 0.0039, AIC= 54.62) had a better fit for the data than the FODED model ($r^2 = 0.62$, RMSE = 0.8340, CRM = -0.0095, AIC= 58.61) at the recommended dosage. However, the FODED model gave a better prediction of the pesticide decline ($r^2 = 0.98$, RMSE = 0.2082, CRM= -0.0028, AIC= 18.44) than the SFOK model ($r^2 = 0.97$, RMSE = 0.2712, CRM= 0.0836, AIC= 19.96) at double the recommended dosage.

Conclusion: This suggests a bi-phasic pattern for the pesticide decline at double the recommended dosage. In this case, the initial concentration of the pesticide in the solution phase dissipates rapidly and the rest, which may be absorbed by the plant tissues, reaches a dynamic equilibrium and degrades rather slowly.

Keyword: Diazinon residues, first-order double-exponential decay model, first-order kinetic model, GC-NPD.

The authors thank the University of Tehran for the financial support of this project.

Abstract No: 311

Determination of Nivalenol and Deoxynivalenol mycotoxins levels in wheat flour of flour factories in Ahvaz city using HPLC/UV

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Abstract

Background: Wheat is frequently contaminated by the deoxynivalenol (DON) and nivalenol (NIV), which are produced by fungi of the *Fusarium* genus and belong to the type B trichotecenes. The most problems caused with these toxins are from prolonged feed intake at low contamination levels. This study was carried out to determine the concentration of deoxynivalenol and nivalenol in wheat flour produced by factories in Ahvaz city, Khuzestan Province, Iran using HPLC/UV method.

Materials & Method: 26 composite wheat flour samples (comprising 10 grab samples) were collected from 2 factories (totally 52 samples) in Ahvaz city. 25 g of each sample was weighed out, extracted by acetonitrile/water mixture (84:16, v/v), and the mixtures were blended for 3 min at high speed with a blender. The extract was filtered through Whatman No.4 paper and 8 ml of the extract was purified through MycoSep 227 column, according to the instructions of the manufacturer. The purified extract was collected and then 4 ml of it was transferred to another tube and evaporated to dryness under a steam of nitrogen at 40°C. The dry residue was dissolved and mixed well in 0.4 ml of mobile phase and then, 50 µl of that injected into HPLC equipped with column C18 (150 mm × 4.6 mm ID, 5µm) and UV detector at 220 nm and the column temperature was maintained at 40°C during the process. A mobile phase consisting of a mixture of acetonitrile, methanol and water (5/5/90, V/V/V) was used at flow rate 1.0 ml/min. LOD and LOQ were 10µg/kg and 37.5µg/kg and recoveries mean were 93.2% and 92.01% for DON and NIV, respectively.

Results: Of 52 wheat flour samples, 27 samples (51.9%) and 19(36.5%) were contaminated by DON and NIV respectively. The highest and mean concentrations of DON and NIV belonged to Ard mahziyar and Ard Ahvaz factories with 536, 79.88 and 1559, 214.28 ng/g respectively.

Mean concentration of DON and NIV samples were significantly lower than maximum permitted limit of 1µg/g level set by the Institute of Standards and Industrial Research of Iran (ISIRI) and European Commission in wheat flour.

Keyword: Mycotoxins, Deoxynivalenol, Nivalenol, HPLC/UV, Wheat Flour, MycoSep column

Abstract No: 327

Review of Aluminum phosphide poisoning

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Abstract

Background: Aluminum phosphide (ALP) is a cheap, effective and commonly used pesticide. In Iran it is known as the “rice tablet”. However, unfortunately, in some eastern countries it is a very common agent with rapid action for suicide. It liberates lethal phosphine gas when it comes in contact either with atmospheric moisture or with hydrochloric acid in the stomach. The release of cytotoxic phosphine gas primarily affects the heart, lungs, gastrointestinal tract and kidneys, although all organs can be involved. The mechanism of toxicity includes cellular hypoxia due to the effect on mitochondria, inhibition of cytochrome C oxidase and formation of highly reactive hydroxyl radicals.

Materials & Methods: The search for this review was done in PubMed, ScienceDirect Scopus, Google scholar databases and Iranian ones, Iranmedex and SID. Data were collected from 2004 to 2015 (up to “ ,”Aluminum phosphide“January). The search terms were: poisoning”, “toxicity”. From the initial search of bibliographic data bases, related articles were identified and each article was reviewed.

Conclusion: Exposure to phosphine gas released from ALP fumigants increases risks of major morbidity and mortality. Also the toxicity of ALP particularly affects the cardiac and vascular tissues, which manifest as profound and refractory hypotension, congestive heart failure and electrocardiographic abnormalities. Due to no known specific antidote, Treatment consists of early gastric lavage, vasopressors and supportive care. Specific therapy with intravenous magnesium sulphate is recommended. There is an increasing need for improved knowledge of these risks with an emphasis on recognition, management and prevention.

Keyword: Aluminum phosphide, poisoning, toxicity, phosphine

Abstract No: 325

Optimization of Expression of a native Sea Anemone Toxin Protein, Fragaceatoxin C, in E. coli BL21

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Abstract

Background: Sea anemones of the genus *Actinia* are very common in the intertidal zone of the northern rocky coast of Spain. *Actinia fragacea* one of the most important species that secrete toxic protein fragaceatoxin C for defense and hunting. The toxin is one of the family of eukaryotic toxins called actinoporins, or cytolytins.

Materials & Methods: The main objective of this study is to transfer plasmid containing the gene encoding the fragaceatoxin C to *Escherichia coli* bacterial strain BL21, and find optimum expression condition. For chemical transformation, bacteria were washed with cold calcium chloride to take up the plasmid containing the interest gene. To ensure that the plasmid was transferred, bacteria were grown on a medium containing the appropriate antibiotic. For greater certainty, transformed plasmids were miniprep using GF-1 plasmid DNA extraction Kit. Then it went under digestion check using *Nco*I enzyme. After confirming the presence of a plasmid containing gene of interest in the host bacteria, the bacteria were induced by 1 mM IPTG at different times at the temperature of 20 °C to find out optimum expression condition of the Fra C protein. After collecting bacteria expressing Fra C at different time. Their expression visualized on Sodium dodecyl sulfate-polyacrylamide gel (SDS-PAGE). Our results showed that the Fra C was successfully expressed at times of 6 and 8 h using 1mM IPTG and 20 °C.

Results: Expression and production of Fra C by recombinant DNA technology will give us large amount of protein which will in turn let us to evaluate it diverse functions and its structure.

Keywords: Sea Anemone, Fragaceatoxin C, Transformation, Expression, E.coli

Abstract No: 321

The effect of water hardness on digoxin therapy in experimental rat model

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Abstract

Background: Digoxin is an acceptable choice for ventricular rate control in AF. The major challenge in digoxin therapy is to adjust the appropriate concentration range for this drug due to its narrow therapeutic index. Unique physiochemical properties of drinking water affect the pharmacological actions and delivery of drugs to the body whether they are administered orally, topically or by injection. The aim of this study was the evaluation of water hardness effect on digoxin therapy in experimental rat model.

Materials & Method: Thirty six rats weighing 200-220g were randomly assigned to three groups that received 50, 400 and 800 mg/L of calcium as different hardness drinking water groups for 28 days. Then each group assigned to two groups. One received digoxin 0.2mg/kg a day orally for four days. The other group received normal saline (as control group). Continuous recording of Electrocardiogram (ECG) were performed by POWERLAB AD Instrumentation before and day 4 after digoxin treatment. Then all the rats were sacrificed and the serum samples were collected and assessed for digoxin, sodium, potassium, calcium, magnesium, BUN, creatinin.

Results: Our data shows that, water hardness in the range of 50-800 had no effect on serum digoxin levels ($p>0.05$) but consuming hard drinking water (400 and 800 mg/L) could increase serum calcium levels and then cause mortality (33%) following changes in ECG due to digoxin toxicity.

Conclusion: Consuming hard drinking water could interfere with digoxin pharmacodynamics.

Keyword: Digoxin, water hardness, ECG, calcium.

Abstract No: 314

A Concise toxinological Study on ‘upside-down jellyfish’, *Cassiopea Andromeda* ((Forsskal, 1775) Crude venom from the Persian Gulf, Bushehr-Iran

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Abstract

Background: The so called ‘upside-down jellyfish’, *Cassiopea Andromeda* ((Forsskal, 1775), is not native to the Persian Gulf, but invasively entered the coastal waters near assalouyeh (Bushehr, Iran). This jellyfish produces very potent and rapid-acting venom that is injurious to humans and fatal to their victims. Up till now, the biological active components and mechanisms of toxicity of the venom were poorly considered.

Materials & Method: Aimed at study of some toxicological effects of ‘upside-down jellyfish’, they were collected coastal waters near assalouyeh in Bushehr province; Crude form of jellyfish venom was extracted from whole, fresh, and freeze-dried tentacles that placed immediately in seawater, and from isolated nematocysts. Extraction procedures were including tissue grinding, homogenization, sonication, centrifuging, and lyophilization. The protein content of the sample was achieved via Bradford Lowry assay by Nano drop devise. It was expected that protein concentration was correlated with venom concentration.

For Molecular weight determination the SDS-PAGE electrophoresis (12% polyacrylamide gel) was performed according to the method of Laemmli (1970), and the proteins were visualized with Coomassie Brilliant Blue. The LD50 were established by injection of 0.5 ml of sample into the tail vein of male albino mice and for the recording mortality, the Spearman-Kärber statistical method was used for its calculation, and result was stated as µg/kg BW of mice.

Results: The LD50 (IV mouse) was 104.0 µg/kg BW. The protein content of the crude venom was estimated to be 17.5 mg/ml of lyophilized crude extract. The SDS-PAGE of the crude venom showed the presence of at least 8 bands, ranging from 12-225 kDa.

The present work as a initiated the great study, defines the potency of the venom, protein content and number and MW of bands in SDS-PAGE from the crude venom, designed for more toxinological study on this mysterious jellyfish as a guest of the Persian Gulf.

Keywords: Cassiopea Andromeda, Upside-down Jellyfish, SDS-PAGE, LD50, Persian Gulf

Abstract No: 303

Maximum acceptable toxicant concentration (MATC) of formalin in common carp fish (*Cyprinus carpio*) in different body weight, dose and temperature

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Abstract

Background: Today, using formalin has boomed more than ever in the aquaculture industry to affairs of treatment and prevention and is used for treatment of fungal, parasitic, bacterial and viral diseases. With attention to the sensitivity of different fishes as well as effects of different variables such as temperature and weight, different concentrations of the drug should be used in aquatics. In this study common carp was used for testing.

Materials & Method: Fishes were kept in the 80-liter glass aquarium in the laboratory. Fishes were weighed into two groups 11-200 grams and 2.5 to 10 grams in terms of size. Used formalin was at concentrations of 80, 100, 120 and 140 ppm. Also desired concentrations were tested for assessments of temperature effect on the formalin toxicity rate on temperatures of 15, 20 and 30. All experiments were carried out with three replications and other physicochemical conditions of the water were identical.

Result: The results of this study were revealed that there is no loss of fish weighing 11-200 grams at doses of 80 and 100 ppm in first 24 (LC50 24h) and 48 hours (LC50 48h). And the losses rate in the first (LC50 24h), second (LC50 48h) and third 24 hours (LC50 72h) were equal to 30%, 40% and 100%, respectively, in dose of 120 ppm and its rate for dose of 140 ppm was 100% in initial hours. Also weight group of 2.5-10 grams was safe and no losses at dose of 80 ppm in all timescales. But the losses rate in the first, second, third and forth 24 hours were equal to 50%, 40%, 50% and 40% respectively, in dose of 100 ppm. These values for dose of 120 ppm were equal to 70%, 80%, 82% and 100%. This loss rate for 140 ppm dose was 100% in initial hours. Also, the results of changes in temperature showed an increase fishes losses with increase in temperature and the highest and lowest losses were obtained at temperatures of 30 and 15 degrees, respectively.

Conclusion: The results of this study were illustrated toxicity of formalin in dose of 120 ppm and 100% mortality in carp fishes. Also the formalin toxicity rate increases exponentially with increasing temperature. Safe level of formalin is for carp fishes in 80 ppm.

Keyword: formalin, common carp, toxicity rate, formalin, MATC

Abstract No: 282

An insilico designing of a fusion proteinfor detection of toxins a and b antiserum in diagnostic aims

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Abstract

Background: An insilico designing of a fusion recombinant protein composed of highest scored fragments of clostridium difficile toxins a and b for dignostic aims Clostridium difficile, is a causative agent for colitis and some syndromes in human and animals. Toxins a and b are two most virulence agents in this bacteria. So accurate and rapid detection of pathogen is very important in management of disease. A recombinant fusion protein designed on the basis of epitopic regions of toxins a and b can be used in diagnostic cases. Tcda and b are big proteins with 308 and 269 kd molecular weight so for selecting the best epitopic regions of these two toxins initially we Have divided them into 5fragments ;ta1.ta2.ta3.ta4.ta5.tb1.tb2.tb3.tb4.tb5. The amino acid sequence of toxin was obtained from ncbi. PDB structure of toxin has received from i-tasser online tool. The energy minimizing of modeled structure was performed by gromos and pdb viewer softwares. Prediction of b cell conformational epitopes was done on the validated 3d model and performed by bcpred, Ellipro and iEDB softwares. For each fragment one score has indicated and calculated. Finally. Highest scored fragments of each toxin was selected and we utilised them for designing of fusion protein.

Results: The results indicated that ta3 and ta5 are most suitable candidates to produce a diagnostic fused product as a tool for detection of both toxins. A linker has been designed for final structure of selected fragments and designed linker was obtained from itasser and expassy secondary structure tools.

Keyword: Insilico. Fragment. Toxin a. Toxin b.

Abstract No: 501

Determination of residual abamectin in citrus fruits in the market supply of urmia with dispersive liquid liquid microextraction and HPLC–UV detection

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Abstract

Background: Abamectin is a highly pesticidal agent that contains a macrocyclic lactone derived from the soil bacterium streptomyces avermitilis. Abamectin is the product developed by Merck Co. Inc. as acaricide, insecticide and nematicides for crop protection. Among abamectins, a mixture of different avermectins (AVMs), AVM B1 is the major active ingredient and consists of a mixture of two homologs. AVM B1 contains not less than 80% AVM B1a and not more than 20% AVM B1b. the main purpose of this study was to develop a rapid, sensitive, and quantitative technique for the determination of AVMs in citrus fruits.

Methods & Materials: 2 g of the homogenized sample was weighed in a 50 mL centrifuge tube and 8 mL of acetonitrile/water 4:1 v/v was added. Ultrasound-assisted extraction was carried out for 15 min. sample was centrifuged at 4000 rpm and transford from SPE for clean-up and preconcentration. Solution obtained from SPE dispersive by acetonitril and carbon tetrachloride.

Results: The calibration curves showed a satisfactory linearity within the concentration range: 0.005–8.0 mg/kg for B1a and 0.04–8.0 mg/kg for B1b. The LODs was 0.002 and 0.01 mg/kg for B1a and B1b, respectively, which was below the maximum residue limits (0.02 mg/kg). The precision expressed as the RSDs (n = 6) was 5.4 and 7.6% for B1a and B1b, respectively.

Conclusion: this method was developed for the determination of abamectin in citrus fruit samples. Citrus samples were extracted by ultrasound-assisted extraction followed by SPE as a preconcentration and clean-up step. Then, the solid-phase extract was used as a disperser solvent of the next DLLME step for further purification and enrichment of the analytes before HPLC analysis.

Keywords: Abamectin, determination, microextraction, HPLC

Abstract No: 486

Effect of different waterborne copper nanoparticles level on intestine histopathology of rainbow trout (*Oncorhynchus mykiss*) fry

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Abstract

Background: Copper is an essential trace metal in small concentrations for several fish metabolic functions. Essentiality of copper arises from its specific incorporation into a variety of enzymes which play important roles in physiological processes (e.g. enzymes involved in cellular respiration, free radical defense, neurotransmitter function, connective tissue biosynthesis and other functions), as well as, into some structural proteins. Copper is also toxic in excess.

Methods & Materials: In the present study totally 300 rainbow trout fry with initial weight 6.44 ± 0.37 g (Mean \pm SE) were randomly distributed in 15 fiberglass tanks (with 45 L volume and 20 L water volume) at 5 different Cu-NPs treatments with 3 replicates. Treatments included control (no added Cu-NPs), 5, 10, 20 and 40 μ g/l Cu-NPs (mean primary particle size of 2-6 nm) in a semi-static waterborne exposure regime. In order to find the histopathological changes, sampling of intestine in fish was carried out on day 10. Histological samples were dehydrated by routine methods and embedded in paraffin wax. They were sectioned by microtome and stained with H & E.

Results: In groups that received 5 and 10 μ g/l Cu-NPs the intestinal folds were widened with infiltration of leucocytes. The folds were malformed and some were necrotic with vacoulation in the epithelial cells. Extensive necrosis were observed in groups that received 20 and 40 μ g/l Cu-NPs. The interests were completely necrotic and intestinal folds were totally destroyed.

Keywords: Copper, nanoparticles, intestine, rainbow trout, fry

Abstract No: 484

Determination of scorpion venom LD50S of 4 species in Khuzestan, SW Iran

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Abstract

Background: In spite of worldwide debates on serotherapy of the scorpion envenoming syndrome serotherapy is considered as the only specific treatment of scorpion stings in such countries like Saudi Arabia and Iran. The Iranian scorpion antivenom is made through the process of injecting horses with a mixture of 6 species. Regarding to make it adequate assessment of scorpion venom LD50 is an important step for accurate evaluation of antivenom sera potencies and the optimization of Serotherapy. Therefore, in the current study LD50s of 4 species of Khuzestan scorpion venom were determined. This information will be used by authorities and researchers to make the local and more effective anti venom of the scorpions.

Methods & Materials: Samples of 4 scorpion species were collected from some parts of Khuzestan using UV light technique overnight. Venoms were obtained from scorpions by electrical stimulation of telson. In the present study, the used voltages of electricity to extract the venoms were also determined per species of scorpions. The extracted venoms were processed, lyophilized and stored at -20°C until use according to their geographical origins and season of trapping. For toxicity determination, the venom of each species was injected intravenously (IV) with an increasingly concentrations trend to albino mice (18-20grams) using appropriated concentrations of the collected venoms (National Ethics Advisory Committee 2006). Deaths of mice were recorded 24 hours later and LD50s were then calculated by Spearman-Kärber method.

Results: The following voltages are suggested to extract venom of the used scorpion species: 0.30 (V) and 0.50 (V) for *Scorpio maurus* (SM), 0.35 (V) for *Mesobuthus eupeus* (ME), 0.65 (V) and 0.85 (V) for *Androctonus crassicauda* (AC) and 0.2 (V) for *Hemiscorpius lepturus* (HL). Applying this voltages will have the least damage to the scorpion's regards of electrical. Results of the current study were determined the LD50s of venom scorpions (mg/kg mice 18-20 grams) as followings: SM=135±33.75, ME=25±6.25, AC= 6.5±1.63 and HL=107±26.75.

Conclusion: In the current study LD50 of AC was determined as the least and LD50 of SM was the greatest calculated LD50 among the four studied scorpion species. It means that AC venom is the most dangerous venom as the acute envenomation in Khuzestan.

Keywords: Scorpion venoms, LD50, Iran

Abstract No: 470

Xylene Effects on Hair Cell Histology in Guinea Pigs

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Abstract

Background: Chemical-induced hearing loss from exposure to ototoxic chemicals is the major problems in workplaces. The goal of this study was to determine effects of exposure to xylene on cochlea histology in guinea pigs.

Methods & Materials: Guinea pigs with positive preyer's reflex and presence of distortion product otoacoustic emissions, were divided in two groups: control group, which made up five guinea pigs without exposure; and a study group with five guinea pigs which exposed by inhalation to xylene (400 ppm) during two consecutive weeks: (6h/d, 5d/wk). Animals were killed 14 days after last exposure, temporal bones were removed immediately and perilymphatic spaces perfused with 2% paraformaldehyde. Temporal bones were decalcified by 5% nitric acid, then after dehydration, specimens were embedded and prepared slides (with 5 µm sections) for each guinea pigs, stained with hematoxylin and eosin. Outer and inner hair cells histology was assessed by light microscopy and three-dimensional histological technology.

Results: Histological analysis showed hydropic degenerated and vacuolated inner hair cells (IHCs) and pyknotic of outer hair cells (OHCs) in xylene exposed group in compared to control group.

Conclusion: Xylene as an ototoxic chemical could cause changes in cochlear histology; also such exposures in industries could affect auditory system and lead to hearing losses.

Keywords: Xylene, Hair cells, Histology, Guinea Pigs

Abstract No: 26

Isolation of pesticide-degrading bacteria and Extraction and Purification of OPH enzyme from it

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Abstract

Background: Organophosphorus pesticides (OPs) are group of neurotoxins that are commonly used as insecticides, pesticides and chemical warfare agents [1]. These compounds include Diazinon, Paroxon, Parathion, Methyl Parathion, Coumaphos and combat factors of Sarin and Soman [2, 3]. OPs intoxicate thousands of humans, and cause much death in the world every year [4]. The use of such compounds as insecticides and pesticides is 25 times more than other compounds in Iran [5]. These compounds inhibit acetyl cholinesterase (AChE) in the nervous system, leading to a subsequent loss of nerve function and eventually death therefore, they are known as nerve poisons [2, 5-8]. After usage, these compounds remain in soil, water, agricultural products and aquatic products [9]. One of the main ways to resolve the problem of OPs residue is to bioremediate them [10]. Organophosphorus hydrolase (OPH) is a homodimeric and metal dependent enzyme which has applications in detoxification, decontamination and biodegradation of OPs containing agricultural field and chemical weapons stock [11, 12]. A variety of organophosphorus pesticide-degrading bacteria, have been isolated. These bacteria are able to grow in OPs containing soils and use the OPs as carbon source.

Materials & Methods: Study was carried on the isolation and characterization of OPs degrading bacterial strains from different types of Diazinon-treated farm soils. Among different bacterial isolates obtained, one isolate that effectively degrades OPs such as Diazinon and Paraoxon was finally selected for further studies. Extraction and purification of OPH from selected isolate was carried. Enzyme was purified from crude extract by ammonium sulfate precipitation, dialyze and DEAE-sephrose CL-6B chromatography. The selected isolate was identified by morphological, biochemical and 16S rRNA gene sequence analysis as *Pseudomonas aeruginosa* NL01. Enzyme designated as OPH NL07 with molecular weight of 36 kDa on SDS-PAGE. Optimum temperature and pH of OPH activity was 37°C and pH 8. Co²⁺ cation remarkably improved the OPH activity up to 128% while SDS and EDTA decreased activity to 6% and 0%, respectively.

Results: In this study, the isolated strain contains OPs hydrolyzing enzyme had a high potential to detoxificate Diazinon and paraoxon. Low K_m value and good pH and temperature stability could make the purified enzyme an attractive biocatalyst for applied bioremediation. In addition, this new organism with high potential activity to hydrolyze the organophosphorus compounds is a very useful tool for application in biofertilizers for efficient biodegradation and bioremediation. Future studies need to determine the enzyme modulation, cloning and expression, and its stabilization and immobilization.

Keywords: Organophosphorous compounds (OPC), Organophosphorus Hydrolase (OPH), Diazinon, *Pseudomonas aeruginosa*

Abstract No: 25

Enhancing Organophosphorus Hydrolase Stability by Immobilization on Chitosan Beads Containing Glutaraldehyde

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Abstract

Background: Organophosphorous compounds(OPC) are one group of ester and amide or derivatives of toxic thiol-phosphoric compounds widely used in various industries, particularly in agriculture and controlling insects and pests as well as in defense industries[1]. The use of such compounds as insecticides and pesticides is 25 times more than other compounds in Iran [2].Such compounds cause the deactivation of Acetyl cholinesterase enzyme (AChE) and create complications in organisms; therefore, they are known as nerve poisons [1-4]. These compounds include Diazinon, Paroxon, Parathion, Methyl Parathion, Coumaphos and combat factors of Sarin and Soman[1, 5].Considering the high half-life and stability of OPs in the environment, access to various methods for identifying and disintegration of them is considerable[6]. Development of enzymatic cases for breaking-down of OPs is one of the most important topics for researches [7]. Organophosphorus Hydrolase (OPH) enzyme is the most important enzyme for the identification and detoxification of organophosphorus compounds [5, 8]. Immobilization of OPH enzyme on various supports is one of the most effective methods to develop identification and detoxification. As a biopolymer including reactive amine and hydroxyl groups, chitosan is particularly important and has many applications in the field of immobilization. Most advantages of using chitosan include high affinity to protein, degradability in environment, Hydrophilicity, ability to reproduce and easy preparation in various geometrical configurations, nontoxicity, and biocompatibility, low cost, availability, healthy for human and natural environment [9, 10-14].

Materials & Methods: In the present study, OPH enzyme was immobilized on chitosan beads and glutaraldehyde was used as cross-linker. Binding the enzyme to chitosan beads was confirmed by Fourier Transform Infrared Spectroscopy (FTIR) system and the assessment of its activity was also confirmed. The thermal stability of free and immobilized enzymes was measured in the temperature range of 25-80 °C. The pH stability of free and immobilized enzymes was examined at 2-12 pH and the assessment of the reusability of immobilized enzyme was also investigated. The results showed that the thermal stability and pH of the immobilized enzyme was more than

that of the free enzyme. Evaluating the reusability of immobilized enzyme indicated that the immobilized enzyme can be applied at least three times without decreasing its activity.

Results: The results of this study show the positive role of immobilizing the enzyme in increasing its activity, stability and reusability. Immobilized enzyme can be used in various biological conditions and break-down soil toxins. Also it is used to identify toxic soils.

Keyword: Organophosphorous compounds (OPC), Chitosan, Organophosphorus Hydrolase (OPH), and Glutaraldehyde

Abstract No: 274

Hematological effects of Mesobuthus eupeus venom on chicken

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Abstract

Background: The awareness from animal's resistance to various toxins can help in understanding the mechanism of toxic action. According to public opinion, chickens are resistant to the toxic effects of scorpion venom; this research aimed to, evaluate the clinical and hematological effects of Mesobuthus eupeus scorpion venom on chickens.

Materials & Method: Adult chickens were injected with two doses 3 and 6 mg/kg of M.eupeus venom orally, subcutaneously and intravenously. The symptoms were recorded at intervals of 0, 15, 30, 60, 120, 240 minutes, 24, and 48 hours, and 0.5 mL of venous blood with EDTA anticoagulant were collected, each time. Hematological analysis including the level of hematocrit, hemoglobin, and red blood cells, total leukocytes, heterophils, lymphocytes and monocytes counts were performed.

Result: No specific clinical symptoms were observed in the oral administrated groups at any time intervals. Shortness of breath and lethargy were observed in the group injected with 3 mg/kg subcutaneously, after one hour. These signs reduced after 2 hours and completely resolved over 4 hours. Clinical symptoms including increased respiration, increased oral secretions and bloody stools were observed 0.5 hours after the intravenous injection. At dose of 6 mg / kg, symptoms included mucous diarrhea, lameness, increased respiration, and drooping wing after 20 minutes. In both groups, these symptoms completely disappeared after 24 hours. Hematological examination of intravenously injected chickens, revealed an increase in monocytes and decrease in lymphocytes counts after 15 and 60 minutes, respectively.

Conclusion: In orally and subcutaneously injected animals, the lymphocytes count was reduced and neutrophils and monocytes were increased after 60 minutes. The number of erythrocytes, hematocrit and hemoglobin were stable in all time periods. Returns to normal levels were recorded in all cases after 24 hours. It appears that resistance to the toxic effects of the scorpion venom was greater in poultry than mammals, which is compatible with haematological studies, conducted in this area.

Keywords: Hematological, Mesobuthus eupeus, Venom, chicken

Abstract No: 457

Determination of heavy metal concentration in water distribution network in Bushehr province, Iran

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Abstract

Background: Heavy metals are one of the compounds that can enter the water sources through different ways. Consumption of heavy metals in amounts that exceed standard levels is associated with risks such as toxicity and carcinogenesis and development of disease. This study was carried out to determine heavy metals concentration (As, Cu, Pb, Zn, Cd & Hg) in Bushehr drinking water and its comparison with national and international standards. The present research which was conducted in spring 2014 is based on descriptive periodic method.

Methods & Materials: During the research, a number of 35 were gathered and Concentration of heavy metals (zinc, copper, lead, cadmium, arsenic and mercury) was measured by atomic absorption spectrophotometric method. Cadmium, Copper and Hg concentrations did not exceed national and international standards, Lead, arsenic and zinc concentration were slightly higher than standard level in some areas.

Results: There was no significant correlation between the metals concentrations and water sources. In the recent years, numerous researches have shown that different polluting materials like metal elements are transferred to waters through different natural and artificial (human activity) ways which biological control can prove to be a desirable and satisfactory method for measuring the level of heavy metals and their biological accessibility.

Conclusion: As such, planning for constant control of water reservoirs seems to be necessary.

Keywords: Drinking water, Heavy metals concentration, Atomic absorption method

Abstract No: 406

Relation of polycyclic aromatic hydrocarbons and tuberculosis in Sistan

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Sedighe Heidari Razavi

Abstract

Background: The polycyclic aromatic hydrocarbons (PHAs) enter atmosphere from organic materials incomplete combustion. They produce of human industrial activities generally. They categorized as carcinogenic materials type I by The International Agency for Research on Cancer. The PHAs have significant relation with tuberculosis disease. In order to high incidence of tuberculosis in Sistan, in this study we tried to evaluate PHAs level in Sistan drinking water.

Method & Materials: In cross sectional study, presence of 16 types of PHAs evaluated in Sistan drinking water by fluorescence detector of high performance liquid chromatography. Double distilled water used as control sample. This experiment was done once a month for 5 months on Sistan drinking water. Finally data analyzed using SPSS21 software.

Results: Data analysis showed that PHAs level in Sistan drinking water is less than united states environmental protection agency limit. Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benz[a]anthracene, Chrysene, Benzo[b]fluoranthene, Benzo[k]fluoranthene, Benzo[a]pyrene, Dibenzo[a,h] Anthracene, Benzo[ghi]perylene and Indeno(1,2,3-cd)pyrene presence in drinking water evaluated as 2.30, 1.31, 2.04, 1.13, 0.150, 0.140, 0.125, 0.004, 0.004, 0.160, 0.006, 0.003, 0.016, 0.035, 0.020 and 0.036 µg/lit respectively. No significant relation observed between PHAs and tuberculosis. ($p>0.05$)

Conclusion: Although polycyclic aromatic hydrocarbons are less than limit in Sistan drinking water, but we have to pay attention more on PHAs relation with tuberculosis, high tuberculosis incidence and different ways of PHAs entrance to human body. (not just drinking, eating food dependent to PHAs contaminating water, inhalation of droplets containing PHAs carried by the wind and ...) As PHAs are oil soluble contaminants, therefore they will present on oil stains n the top of water and could easily enter to air as droplets and enter human respiratory airways. Therefore we are suggesting PHAs evaluation in tuberculosis patient sputum specially naphthalene and phenanthrene.

Keywords: PHAs; Tuberculosis; HPLC; Sistan; Water.

Abstract No: 400

Determination and residual of Organophosphorus and Organochlorine pesticides in dietary intake: In West Azerbaijan

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Abstract

Background: The purpose of this study is to determination and residual of Organophosphorus and Organochlorine pesticides in dietary intake: In West Azerbaijan

Methods & Materials: In this study foods such as: bread, rice, tomatoes, potatoes, carrots, which most people consumed, are selected. Samples, which purchased randomly from different parts of the Urmia city, are examined. Pesticides seperated from samples by mixed ether de petrole and ether ethilic and then condensed up to 10 cc by an evaporator. After refining and evaporating in evacuation, the rest of them are soluted in 10 ml normal hexan and injected in to G.C. finally, the results compared to standard indexes.

Results: After comparing the results with allowable index, it is seen that, sometimes, some amount of pesticides is more than allowable intake diet. So, this can be a serious risk for consumers' health.

Conclusion: Comparision of the results shows that the pattern of consumption should not be forgotten, and standards should be conserved. In order to decrease the level of pesticides in foods, the farmers should be trained, because ignoring toxic currency period or not being careful about selecting of consumed pesticides can decrease safety of foods.

Keywords: Organophosphorus, Organochlorine, Diet

Abstract No: 388

Effect of vitamin C on spatial memory and oxidative stress alteration during paraquat toxicity in male rats

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Absrtact

Background: Paraquat (PQ), is one of the most widely used herbicide all over the world. It is classified as a viologen, a family of redox-active heterocycles of similar structure. It is quick-acting and non-selective, killing green plant tissue on contact. For many years the acute toxic effects of PQ in the lung, liver and kidneys have been well recognized in human and probably in animals. We investigated the recovery effect of vitamin C on spatial memory along with oxidative stress parameters during PQ induced neurotoxicity in male rats.

Materials & Methods: Forty two male Wistar rats were randomly divided into six groups (n= 7): control (saline 0.9%), PQ (2.67 and 5 mg/kg), vitamin C (80 mg/kg), vit-C (80 mg/kg) plus PQ (2.67), and vit-C (80 mg/kg) plus PQ (5 mg/kg). The period of intraperitoneal injection (IP) was once a day and for 5 consecutive days. The Morris water maze used for studying the spatial memory. After termination of behavioral testing days, animals were decapitated and left hemisphere dissected to measure some of the oxidative stress markers. The level of lipid peroxidation, and activity of antioxidant enzymes; superoxide dismutase (SOD) and catalase (CAT), were determined in the left hemisphere of rats. Data analysis was performed by using one way ANOVA.

Result: Results showed that IP injection of PQ in both doses, 2.67 mg/kg ($P<0.05$) and 5mg/kg ($P<0.01$) significantly decreased the spatial memory. Vitamin C has no significant improving effect on the recovery of spatial memory in the PQ treated groups. The total SOD activity in PQ-treated groups (2.67 and 5mg/kg) was significantly lower than that of control ($p<0.001$). The level of CAT increased, in Vit-C-PQ groups in a dose-dependently manner ($p<0.001$). Lipid peroxidation was significantly increased in PQ-treated group ($p<0.001$). In PQ-treated groups that were supplemented with vitamin C, SOD activity and lipid peroxidation level were restored to normalcy.

Conclusion: Our data revealed that PQ can impair the spatial memory via induction of oxidative stress in the brain tissue. Vitamin C can prevent or diminish the oxidative stress markers in the PQ-treated rats, but it cannot significantly overcome to the destructive effect of PQ on spatial memory.

Keywords: Oxidative stress, Paraquat, Spatial memory, Vitamin

Abstract No: 373

Prevalence rate and epidemiological determinants of animal bite in Ahvaz County, Southwestern Iran

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Abstract

Background: The prevalence rate of animal bites in Iran has been increasing in recent years. Annually 140 cases per 100000 population are estimated to occur in Iran. ; more than 85% of them are dog bites. This study was designed to investigate the prevalence rate and epidemiological aspects of animal bite in Ahvaz County (western part), during the 2nd half 2003 – 2007.

Materials & Method: In this descriptive cross-sectional investigation a questionnaire was completed for each victim. The questionnaire included questions like, occupation, gender, age group, attacker animal, vaccination type, bite place on the body, type of dog bite (stray or domestic dog), residential area. Data analysis was done by SPSS software using descriptive statistics.

Results: The total number of 4186 cases had been found. The highest number of bitten persons were in 2007 (1079 cases) and 2005 (1032 cases). The maximum prevalence rate belonged to 2005 (2.04 / 1000 population). Eighty percent of the bites were from urban regions. The majority of cases were related to 10 – 19 years age group (32.8%). The highest frequency of bites were students (28.9%). Upper extremities were the most common bite place (61.4%). About 91.3% of cases were injured by dogs. Furthermore, around 83.7% of animal bites treated by incomplete rabies prophylaxis regimen. No cases of human rabies were observed in our study.

Conclusions: The dogs were the major attacker animal, affecting mostly the age group 10-19 years old and men. Therefore, we should pay more attention about controlling this problem.

Keywords: Prevalence Rate, Epidemiology, Animal Bite, Rabies, Iran.

Abstract No: 369

Evaluation of intra-hippocampal infusion of auraptene, resveratrol and curcumin on H-89 induced spatial memory acquisition and retention in male rats in Morris water maze

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Abstract

Background: In the present study, the four-day bilateral intra-hippocampal (i.h.) infusions of dimethyl sulfoxide (DMSO, 0.2%), H-89 as a protein kinase AII inhibitor (10 μ M/side), auraptene (2.5, 5, 10 μ M/side)/H-89(10 μ M/side), resveratrol (25, 50, 100 μ M/side)/H-89(10 μ M/side) and curcumin (10, 25, 50 μ M/side)/H-89(10 μ M/side) on spatial memory acquisition in Morris water maze (MWM) were investigated.

Materials & Methods: Rats were trained for 4 days; each day included one block of four trials. Post-training probe tests were performed on day 5 in acquisition test. For retention assessments, different animals were trained for 4 days and DMSO (0.2%), H-89 (5 μ M/side), auraptene (2.5 μ M/side)/H-89(5 μ M/side), resveratrol (100 μ M/side)/H-89(5 μ M/side) and curcumin (25 μ M/side)/H-89(5 μ M/side) were infused (i.h.) after last training trial and retention test performed 48h later.

Results: Bilateral intra-hippocampal infusion of H-89 led to a significant impairment in spatial memory in comparison with control group in acquisition and retention tests.

Conclusion: Findings of this study showed that resveratrol and curcumin reversed H-89-induced spatial memory acquisition and retention impairments in MWM but auraptene showed significant improvement just in spatial memory retention test.

Keywords: Resveratrol, Auraptene, Curcumin, Morris Water Maze, Spatial Memory, Hippocampus

Abstract No: 359

Protective effects of curcumin and vitamin E against chlorpyrifos-induced lung oxidative damage

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Abstract

Background: There are increasing concerns regarding the toxic effects of chlorpyrifos (CPF) on human health. Curcumin (CUR) is a yellow pigment isolated from turmeric ground rhizome of *Curcuma longa* Linn, which has been identified as an antioxidant agent.

Materials & Method: This study was designed to examine the protective effect of CUR and vitamin E (Vit E) on CPF-induced lung toxicity. Rats were divided into seven groups: control, CPF (13.5 mg/kg, orally), CPF + CUR (100 and 300 mg/kg, respectively, orally), CPF + α -tocopherol (Vit E, 150 mg/kg, intraperitoneally), CPF and CUR (100 and 300 mg/kg, respectively) in combination with α -tocopherol. The regimens were administered once daily for 28 days. At the end of the treatment period, lungs were collected for evaluation of oxidative factors and histopathological parameters.

Result: CUR and Vit E led to a decrease in lipid peroxidation in the lungs of the CPF-injected animals (48% and 51%, respectively). Glutathione peroxidase inhibited by CPF (91.9 nmol/min/mg protein) was induced again by CUR and Vit E (167.1 and 171.8 nmol/min/mg protein). CUR and Vit E caused a significant induction of superoxide dismutase (103.4 U/mg protein). Catalase activity almost returned to normalcy in CPF-intoxicated rats subjected to CUR + Vit E treatment ($p < 0.001$). Lung sections from CPF-treated rats displayed histopathological damages, while coadministration of CUR and Vit E resulted in apparently normal morphology with a significant decrease in injuries ($p < 0.05$).

Conclusion: Our findings revealed that coadministration of Vit E and CUR to CPF-treated animals prevents the oxidative damages in the lung tissues.

Keyword: Organophosphates, lung injury, oxidative stress, antioxidant enzymes, protective agents

Abstract No: 351

The Influence of Internal Wall and floor Covering Materials and Ventilation Type on Indoor Radon and Thoron Levels in Hospitals of Kermanshah, Iran

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5-Associated Professor, Medical Physics, Faculty of Medicine, Kermanshah University of Medical Sciences, Kermanshah, Iran.

Abstract

Background: Building materials and ventilation rate of the building are two main factors influencing indoor radon and thoron levels, which have the most important roles in human natural radiation exposure in the dwellings. This study was aimed to determine the relationship between Indoor radon and thoron concentrations and building materials used in interior surfaces as well as ventilation system type (natural or artificial).

Materials & Method: A number of 102 measurements of radon and thoron levels were performed from different parts of three hospital buildings in Kermanshah city, west of Iran, using RTM-1688-2 radon meter. Information on the type of building material and ventilation system in measurement location were collected and using Stata 8 software and multivariate linear regression analyzed.

Results: Based on the results, in terms of radon and thoron emissions, travertine and plaster were found to be the most appropriate and inappropriate covering for walls, respectively. Furthermore, granite and travertine were observed as inappropriate materials for flooring and plastic floor covering as suitable. Natural ventilation for radon and artificial ventilation for thoron showed better performance.

Conclusion: Internal building materials and ventilation type affect indoor radon and thoron concentrations. Thus, the use of proper materials and adequate ventilation reduces the potential exposure to radon and thoron within buildings which is of utmost importance particularly in buildings with high density of residents, including hospitals.

Keyword: Indoor radon and thoron, building material, ventilation, hospital, Iran.

Abstract No: 343

Comparison of oxidative stress parameters, copper and lead levels in blood of copper smelter workers with control group

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Abstract

Background: The copper smelter workers are exposed to different types of metal contaminants these pollutants can affect physical and mental health of individuals and cause a lot of damage to the individual and society. Since the metal ion imbalance causes to create free radicals and antioxidant defense system can cause to produce oxidative stress. The aim of this study was to compare blood lead, copper and oxidative stress parameters in workers exposed to these contaminants and control group.

Materials & Method: In this cross - sectional study, 44 workers at a copper smelter are working at least for 4 years and in one turn. After investigating inclusion criteria, experimental group were selected and matched with 44 subjects in control group for their age, gender, work experience, location and smoking. It should be noted that these groups had no history of occupational exposure to copper, lead and other metal contaminants.

Two groups were compared in terms of their blood lead, serum copper and parameters of oxidative stress (lipid peroxidation, total antioxidant capacity, total thiol groups, catalase, superoxide dismutase, peroxidase, and glutathione peroxidase. For the analysis of data, t T-test, Mann within U test and Pearson correlation coefficient has been used.

Results: The levels of serum copper and blood lead concentration indicated a significant increase in experimental group than the control group ($p = 0.000$) or but the rate of these two elements in the workers 'blood was not higher than standard rate. Average concentration of glutathione peroxidase, catalase and total thiol levels in workers was less than the control group ($p < 0.01$).

Conclusion: Exposure to high levels of copper and other metal contaminants, including lead, arsenic and Cadmium that are released during the process of copper smelting in the smelter workers reduced glutathione peroxidase, catalase and total thiol group which leads to decreasing

the levels of antioxidant and creating oxidative. So the authorities, occupational health medicine industry in terms of their safety measures and periodic checkups should seriously consider workers.

Keywords: copper, lead, copper smelter workers, oxidative stress

Food Toxicology & Natural Toxin

Abstract No: 178

Nitrate in Tomato Derived Products Commercially Available in Tehran

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Abstract

Background: In recent years, an increasing interest concerning determination of nitrate levels in food products has been observed, essentially due to the potential reduction of nitrate to nitrite, which is known to cause adverse effects on human and animal health. The main goal of this study was measuring nitrite and nitrate contents of tomato derived products samples commercially available in Tehran market in comparison on fresh tomato.

Materials & Methods: Taking fresh and untreated samples was done by going to the chosen areas of recognized farms in Khuzestan, Kerman and South of Tehran, and a total of 60 samples were taken and analyzed. In order to conduct a comparison between the content of nitrate and nitrite in the samples studied, dry matter content was determined according to the association of office analytical chemists (AOAC, 2000).

A fifty gram sample of the prepared tomato was blended with 50ml distilled water in a home blender. The mixture was filtered and was passed through a glass 39 column fitted with a tape and filled with Activated alumina, in order to separate the color of Chlorophyll and get a transparent solution. The eluted solution by water filtered using 0.45um filter paper in order to eliminate the turbidity and get a clear solution. Nitrite concentration in tomato samples were determined by spectrophotometric methods at a wavelength of 538 nm, and nitrate concentration was determined after reducing nitrate to nitrite by using cadmium column. Nitrate content in analyzed tomatoes ranges between 81.5543 mg/kg FW with an average of 101.743 mg/kg.

Results: The highest nitrate content was found in Tehran (122.44 mg/kg) and the lowest was in Khuzestan (71.056 mg/kg). For tomato juice, the nitrate level ranges between 66.11 – 74.02 mg/kg with an average of 66.08 mg/kg. All the values are lower than those for corresponding tomatoes. For tomato sauce, the nitrate level ranges between 142.33- 198.75 mg/kg with an average of 172.66 mg/kg. The nitrate levels in tomato sauce are higher than those for corresponding tomatoes due to the concentration process that takes place during tomato processing into sauce.

Conclusion: It is clear that the result of our study shows a variation in the nitrate and nitrite levels in the different crop samples and products.

Keyword: Nitrate, Tomato, Tomato Juice, Iran

Abstract No: 175

Determination of patulin in apple juice using high-performance liquid chromatography method

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Abstract

Background: Patulin is a mycotoxin that is produced by certain species of *Penicillium*, *Aspergillus* and *Byssochyllum* molds that may grow on a variety of foods including fruit, grains, and cheese. Patulin has been found to occur in a number of foods including apple juice, apples and pears with brown, flour, and malt feed. However, given the nature of the food, the manufacturing processes, or consumption practices for many foods, patulin does not appear to pose a safety concern, with the exception of apple juice. The goal of this study is to evaluate of patulin in apple juice utilizing high-performance liquid chromatography method.

Materials & Methods: A rapid, simple and economical method using a limited amount of organic solvent was used for the determination of patulin in apple juice. The total of 64 samples was extracted with ethyl acetate and the extracts were cleaned up by extraction with sodium carbonate solution. Patulin was then determined by reversed-phase liquid chromatography using a MicroPak C18 column and a variable-wavelength PDA detector set at 276 nm. Patulin were completely resolved by using water- acetonitrile (95:5, v/v) as the mobile phase at a flow-rate of 1.0 ml/min.

Results: From 64 assessed samples, 53 samples (82.81%) were negative and 11 samples (17.19%) were positive, ranges from 5.102-26.484 µg/l. The detection limit was <5 µg/l and the recovery was 98%.

Conclusion: The obtained data for the samples compared well to external standard and when plotted against each other displayed a correlation coefficient (R) of 0.99.

Keywords: Determination, Patulin, Apple juice, High performance Liquid chromatography

Abstract No: 171

Molecular identification of fungal species and determination of aflatoxins by HPLC in stored pomegranate seeds in Iran

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Abstract

Background: Fungi cause two distinct problems in stored grains: Grain spoilage due to fungal growth or molds and production of poisonous mycotoxins. The loss of spoilage may have greater economic significance but they are less dangerous than the presence of mycotoxins. This study was conducted to identify aflatoxins using High performance liquid chromatography (HPLC) and molecular identification of fungal contamination in stored pomegranate seeds in Iran. Prepared samples were incubated at 30 ± 1 °C.

Methods & Materials: After primary culture and morphological identification by stereomicroscope, suspicious colonies of *Aspergillus* spores were selected by a single method for isolation. Moreover streptomycin in combination with anti SDA was employed to prevent contamination of bacteria and yeast. According to fungal growth rate in the plates and morphological identification of *Aspergillus* fungus, the CTAB buffer approach was applied for DNA extraction. Aflatoxin producing species were identified using an association of extracted DNA and specific primers. According to the references, two fungi species of *Aspergillus flavus* and *Aspergillus Niger* that have grown over the stored pomegranate seeds, were isolated and identified. The samples were analyzed using high performance liquid chromatography (HPLC) to determine and compare the incidence of aflatoxins.

Results: Our analysis revealed that samples contained 1.1 µg/kg aflatoxin B1, 0.083 µg/kg aflatoxin B2, 0.095 µg/kg aflatoxin G2 and 0.16 µg/kg aflatoxin G1. Our data indicates that long period storage of pomegranate seeds could cause fungal contamination. Aflatoxins are the most toxic and the strongest natural carcinogens.

Conclusion: Hence, strategies should be taken to prevent contamination and improve food safety of products for consumers.

Keyword: Molecular identification, fungal contamination, stored pomegranate seeds, PCR, HPLC

Abstract No: 168

Determination of Bisphenol A from polymeric baby bottles of formula-fed infants

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Abstract

Background: Bisphenol type A (BPA) is a synthetic chemical substance has estrogenic activity and now is classified as the endocrine disrupter chemical and/or so-called xenoestrogens. Due to the high reliance on baby feeding bottles, immature detoxifying system, and their higher ratio of food intake per unit outweighs than that of adults, formula-fed Infants under six months are stated to be the most vulnerable group to BPA hazards. Bisphenol A (2, 2'-bis (4 hydroxyphenyl) propane) in polycarbonate baby bottles has been considered as a health threatening chemical for formula-fed infants. This study aimed at determined BPA from polymeric baby bottles in an urban society in Isfahan.

Methods & Materials: New battles (n=9) were collected from the retail outlet and examined through migration test. Measured by Gas chromatography method, concentrations of the released BPA from the new ranged as 0.43-1.56 µg/l. Probabilistic exposure estimation was adopted as the following step. A survey was conducted by interviewing 200 mothers registered to eleven health centers in Isfahan.

Results & Conclusion: The results showed that the formula-fed infants were exposed to BPA under the defined TDI (50 µg/kgbw/d).

Keywords: Bisphenol A, baby bottle, infant

Abstract No: 153

Optimization of High-Performance Liquid Chromatographic (HPLC) Parameters for the Determination of Furosine in infant milk powder

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Abstract

Background: Heat treatment of milk causes significant changes in milk proteins that can result in losses of their nutritional Value as well as changes of their functional properties. Various methods are presented based on the evaluation of the extent of the Maillard reaction (MR). The evaluation of the early stages of the Maillard reaction, can be achieved by the determination of the furosine, (ϵ -N-2- furoylmethyl-L-lysine), which related to the type and intensity of the Infant formula processing conditions, as well as to the storage conditions. Hence, the furosine determination can be used as a suitable marker for monitoring and assessing quality of the milk products. The aim of this study is optimization and Development an analytical method for determination furosine in Infant formula by using High Performance Liquid Chromatography.

Methods & Materials: In this study, the optimal conditions were determined by HPLC (C18 column, UV detector, Column temperature 30°C, The flow rate : 2ml/min, mobile phase consisted of water: acetonitrile: buffer 79:20:1) Then the method was validated (The linearity of the method, with a correlation coefficient $r^2=0.9996$, and the equation of the regression line $y=1.026x +0.780$, LOD and LOQ were 0.006 and 0.018 $\mu\text{g/ml}$ respectively, Recovery was 0.98% - 102%)

Conclusion: Based on the validated method, infant formula samples were analyzed, some of the samples have got furosine residue.

Keywords: HPLC, Furosine, Maillard reaction

Abstract No: 525

Usage of molecularly imprinted polymers in detection of emerging pollutants in dairy products

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Abstract

Background: Safety of dairy products including raw milk, extended shelf life milks and fermented products (such as yogurt and cheese) nowadays draws too much attention because of highly reported common and emerging pollutants in these products. Chemical emerging pollutants which enlisted as potent carcinogenic compounds such as mycotoxins, residues of antibiotics and pesticides, dioxins, radionuclides, heavy metals, bisphenol A, PAHs (Polycyclic Aromatic Hydrocarbons) are found in various dairy products. Storage, processing conditions and intrinsic factors of product play an important role in formation and retention of these toxic compounds. So monitoring of chemical hazards up to their maximum residue limit is a challenging criteria for approval of dairy products safety. Molecular imprinting polymer (MIP) is a novel separation technique for the creation of materials with tailor-made recognition sites which has garnered significant attention owing to its high selectivity for target molecules.

Methods & Materials: In this method the a physicochemical stable polymer was tailored according to template active sites by means of functional monomers through non-covalent bonds, followed by polymerization of these monomers around the template with the help of a cross-linker in the presence of an initiator. Current sample pretreatment methods, mostly based on the SPE technique, are fast and economical but show a lack of selectivity, while methods based on immunoaffinity extraction are very selective but expensive and not suitable for harsh environments

Results: As emerging pollutants detection needs economical, rapid, and selective cleanup methods, MIPs seem to represent natural alternative to compensate aforementioned drawbacks. MIPs, due to their compatibility to highly complex matrices, are often used for pharmaceutical and biological estimations. In environmental analysis, MIPs are utilized to detect trace amounts of substances, while used in toxicological studies as a useful tool in monitoring norms of dangerous undesirable chemicals.

Conclusion: Here, we discuss about wide range of industrial and environmental pollutants of milk products which could be separated via molecularly imprinted polymers and characterize their efficiencies with common methods.

Keyword: Emerging pollutants, dairy product safety , molecularly imprinted polymers

Abstract No: 209

The comparison between Iranian and imported peanut's ochratoxin level by ELISA method

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Abstract

Background: Nuts are one of the major hosts of mycotoxins because of being full of nutrients. Some of the nuts with lower price such as peanuts are consumed more than others in our society. Mycotoxins grow fast in peanuts in high moisture and high temperature conditions. Ochratoxin is considered as a Carcinogen toxin that has irreparable effects on human health, in this regard, this study is designed to measure the rate of ochratoxin in Iranian (internal) and imported (external) peanuts. One of the most important points is that this toxin has not been measured in nuts in our country yet.

Materials & Method: Measurement of Ochratoxin will be done using conjugated enzyme (Ochratoxin HRP-A) by ELISA method (1ppb). After the necessary experiments, data will be analyzed by Statistical tests such as t-test independent by SPSS (19th version)

Results: In this study, for the first time in Iran, we will compare the amount of Ochratoxin in different types of peanuts, such as the ones produced in Iran or imported from China and India, and also roasted with salt or lime juice, packed and unpacked ones. The results will be represented in the congress.

Keyword: peanut _ mycotoxin _ Ochratoxin _ Iranian _ imported

Supported by research assistance of health faculty, Qazvin university of medical Sciences

Abstract No: 207

Determination of Histamine in Canned Fish Using ELISA Method

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Abstract

Background: Histamine is a potentially hazardous compound and one of the major concerns in food chemistry. Histamine is identified by FDA as a major chemical hazard of seafood products. It is the causative agent of scombroid poisoning and it is a significant public health and safety concern and also a trade issue.

Materials & Method: Histamine content was tested on 120 canned fish samples collected from retail market in Mashhad (Iran) in the years 2012-2013. The analyses were carried out by ELISA method.

Result: Histamine concentration was detected from 6.80 -358.25 mg kg⁻¹ . Histamine of 8 (6.67%) canned fish with range 52.92 – 383.41 mg kg⁻¹ were higher than 50 mg kg⁻¹ which is action level established by FDA legislations. Although for canned fish samples a contamination below 50 mg kg⁻¹ in 112 samples (93.33%) was Observed, the lowest percentage of “non-compliant” samples (6.67%) was found in our study that in respect of other researches that performed in Iran .

Keyword: Histamine, Canned fish, ELISA, Iran, Mashhad

Abstract No: 198

Diagnosis of solanine toxicant in potato tubers using laser reflectance processing and digital camera methods

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Abstract

Background: All organs of potato plants include two glycoalkaloids, alpha-solanine and alpha-chaconine, often called “solanine”. The recommended level of solanine is about 0.2 mg/g (fresh weight) of potato and its growth from the recommended level causes human beings and live stocks poisoning and might lead to their death. The purpose of this study is to check the ability of non-destructive ways like laser and digital camera in recognition of solanine toxicant in potato and comparing accuracy of two methods with each others.

Materials & Methods: Both methods are based on the analysis of pictures, taken from potato's surfaces, but in laser application, laser beam at 635 nm and beam size of 2 mm has been projected to different parts of potato's surfaces and after taking the pictures, laser reflectance feature has been measured.

Results: Results showed that the accuracy of laser method than digital camera, especially in situations that solanine content has been decreased at the surface of potato tubers, is higher, as coefficients of determination for laser and digital camera methods were reported about 92% and 83%, respectively. Although, it was showed that processing time in laser method is shorter and it can be used in sorting systems for grading potatoes based on the safe level of natural toxicants in them.

Keyword: solanine, laser, image processing, potato

Abstract No: 596

Occurrence of Ochratoxin A in grape Juice of Iran and Estimation of its Dietary Intake

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Abstract

Background: The occurrence of Ochratoxin A (OTA) in all of existence brand in market of Iran was determined using high-performance liquid chromatography (HPLC) technique using florescence detector with immune-affinity column as the clean-up step.

Materials & Methods: OTA was determined in 100 samples of grape juice collected from Iran (white or red grape juices). Our results showed that in all of samples of grape juices (N=70), OTA levels were lower the LOQ with the maximum level of 1.3 ng/g. Besides, Iranian grape juice except one brand, when compared with 3 samples from imported products, showed lower OTA occurrence. OTA was extracted from a grape juice sample by passing it through an immune - affinity column with average recoveries and precision (RSD) ranged 41-86% and 2-8%, respectively.

Results: It seems the total intake of OTA was under the provisional maximum tolerable daily intake set for OTA by the JECFA

Keywords: Ochratoxin A (OTA); Grape juice; High-performance liquid chromatography (HPLC), Iran

Abstract No: 195

Survey of Aflatoxin B1 in Cow's feed in Dairy Farms in Kerman Province of Iran

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2- Kerman Agricultural and Natural Resources Research Center

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Abstract

Background: The aim of this study was to assess the levels of aflatoxin B1 (AFB1) in cow's feed samples of dairy farms in Kerman province of Iran.

Materials & Methods: AFB1 was measured in 72 samples, ranging in concentration from <0.01 to 11.02 µg/kg. The immunoaffinity column analysis was used to clean-up of the samples while HPLC instrument was applied to determine AFB1. Samples were collected from six dairy farms.

Result: Results showed that the AFB1 was found in 55.6% of the samples and the average level of AFB1 was below the tolerance limit (5 µg/kg), but 20% of the samples had greater levels than the maximum tolerance limit accepted by EU and the Iranian national standard. The method detection limit (LOD) and limit of quantification (LOQ) and recovery of the method were 1, 3 µg/kg and 87% respectively.

Conclusion: According to the results, AFB1 contamination is a serious problem for cow's milk and finally for public health. To achieve a low level of aflatoxin M1 (AFM1) in milk, cattle feed must be monitored regularly for aflatoxin B1 contamination and protected from fungal contamination as much as possible.

Keyword: Aflatoxin B1, aflatoxin M1, feed, HPLC, immunoaffinity column

This project was supported by Kerman Agricultural and Natural Resources Research Center.

Abstract No: 269

Determination of Total Mercury level in Cyprinus carpio fillet from Aras Dam Reservoir

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Abstract

At present, sea products have a significant role in providing food for the people of the world, and with the acquaintance with the quality and superiority of nutrition of these products to other proteinaceous products, the consumption of sea products is increasing every day. On the other hand, with the increase of water contamination, the probability of causing problems in the quality of this valuable food source has increased. Water contamination by heavy metals is increasing day by day due to industrial and agricultural activities. Among all, contamination by mercury (for the high toxicity and Biomagnification of its organic form) is of high importance.

Martials & Methods: In this study, the level of total mercury in Carp fish living near the Aras Dam is studied. To do so, thirty ordinary Carp fish in various weights were randomly prepared. After drying the muscle tissues and digesting them in Nitric acid 63%, the samples were examined by the Varian Cold Vapor Atomic Absorption device for detecting total mercury.

Results: The results indicated that total mercury in weight categories A (<500gr), B (500-1000gr), and C (>1000gr) is $57.53 \pm 12.54 \text{ ng/gr}$, $75.75 \pm 9.37 \text{ ng/gr}$, and $93.46 \pm 17.82 \text{ ng/gr}$; and the average of total mercury in Carp fish in all weight categories is $75.58 \pm 19.93 \text{ ng/gr}$.

Conclusion: The Statistical T Test and comparing the results with the standard values ($P < 0.05$) proved that the amount of total mercury is within the standard limits of EC, WHO, FAO, and the Iranian national standards. Moreover, a relevant correlation between the weight of fish and the amount of total mercury was obtained. This correlation is completely conformable to biomagnification of mercury in fish.

Keyword: Total Mercury, Aras Dam, and Carp fish

Abstract No: 37

Assessment of Aflatoxin in commercial poultry feed mixture and feed ingredients in West Azerbaijan Province (Iran)

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Abstract

Background: Aflatoxin (AF) is the most economically significant mycotoxin in poultry industry, that mainly produced by *Aspergillus flavus*, *Aspergillus parasiticus* and *Penicillium puberulum*. Aflatoxicosis causes poor feed conversion rate (FCR) and reduced feed intake in broiler chickens. Egg production and the hatchability have also been decreased in intoxicated adult hens. Aflatoxins are acutely toxic, carcinogenic, mutagenic and immunosuppressive to human.

Materials & Method: During this study, a total of 89 samples (poultry feed ingredients and poultry feed) received from various parts of the West Azerbaijan Province and were analyzed by competitive direct enzyme-linked immunosorbent assay (ELISA) for detection of total aflatoxins (B1, B2, G1, G2). Overall incidence of AF was 42 percent. The average contamination levels of AF was 2.83ppb ($\mu\text{g/kg}$), with minimum and maximum level of 0.1 and 43.8ppb, respectively.

Result: The FDA's Aflatoxin Regulations Policy can support enforcement action if aflatoxin levels exceed for Feed of chicks (such as broiler chickens) 20 ppb and for Mature poultry (such as laying hens) is 100 ppb. Poultry reared on diets contaminate with aflatoxin constitute an aflatoxin, threat to the human food supply. The aflatoxin contamination of poultry feeds and feed ingredients having deleterious effects and seems to pose a serious threat for local poultry farming sector, therefore need for regular testing, surveillance of poultry feeds and adoption of necessary consideration measures.

Keyword: Aflatoxin, ELISA, poultry feed, Iran

Abstract No: 138

EVALUATING THE RESIDUES OF CHLORPYRIFOS IN THE RED DELICIOUS APPLE VARIETY OF ARASBARAN AREA IN 2013

Fateme Nasehi, Abolfazl Iraj

Abstract

Background: Increasing world population and food supply shortage have induced technology growth and new agricultural science application for produce more product. Using of pesticides in agriculture increase the product but today due to environmental problems and consequences of pesticide residues and health concerns of these pesticides effects on consumers health, the control of pesticides in agriculture products is an essential topic.

In this research, Chlorpyrifos (the organo-phosphorus pesticide) residues that uses in red Lebanese apple, have investigated at August and September in two group of washed and unwashed apples.

Methods & Materials: For this purpose after random sampling from Ahar gardens, extraction of samples has done by QuEChERS method and clearing has done by using of Amin type 1,2 (PSA) and magnesium sulfate. The analysis of samples has done by gas chromatography (GC) equipped with a nitrogen-phosphorus (NPD) detector.

Results: The results of statistical test T has done for measuring of medium remaining of detected pesticide ($p < 0.05$) and show that Chlorpyrifos pesticide medium in unwashed apples exceeded the MRL.

Also the results of statistical test of medium binary comparison stressed on washing effect on decreasing of Chlorpyrifos ($p < 0.05$).

Conclusion: According this study it is essential that official and farmers attend on amount and use time of pesticides. And it is essential that several organs in agriculture department and health department have more attend to society health.

Keyword: residues of pesticide, Chlorpyrifos, apple and Ahar

Abstract No: 503

Determination of patulin mycotoxin in apple, grape and peach produced in West Azerbaijan by using HPLC

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Abstract

Background: Mycotoxins are toxic secondary metabolites produced by fungi. Patulin (PAT) as one of these mycotoxins is an unsaturated heterocyclic lactone produced by certain species of penicillium, Aspergillus and Byssoschlamys growing on fruits. Patulin has been mainly found in apple and apple products and occasionally in pears, grapes, apricots, strawberries, blueberries and peaches. As PAT is highly soluble in water and highly stable in aqueous acid media, it reaches apple derivative products, such as. Apple juice which is hazardous for human health, not only due to the effects of PAT but also due to the toxicity produced when PAT is combined with other mycotoxins.

Methods & Materials: Transfer 10 g of the sub sample to a plastic cap covered centrifuge tube (50 mL). Add 10 mL ethyl acetate, and shake the tube vigorously for 1 min using Vortex mixer. Centrifuge the mixture at 4500 rpm at 25°C, for 3 min. Transfer the upper organic layer to another centrifuge tube. Repeat the extraction with 10 mL and with 5 mL ethyl acetate and combine the organic layers. Add 2 mL 1.5% Na₂CO₃ solution to the combined ethyl acetate layers and shake the tube vigorously using Vortex mixer for 30 s. Then organic layer dry with anhydrous Na₂SO₄ because patulin could be destroyed if aqueous ethyl acetate extract was evaporated to dryness. Finally dissolve the residue in 1 mL acetic acid solution (pH 4) and analyze with HPLC.

Results: the results of this study showed that the mean concentration of patulin in products was 23.51 µg/l. Overall 8.4% of the apple juice samples had patulin levels higher than 50 µg/l.

Conclusion: Although the mean concentration of patulin in investigated samples was slightly lower than maximum level recommended by the Codex Alimentarius, fairly high incidence of patulin in these samples indicates the need for improving production techniques by industry in order to reduce the incidence and level of patulin contamination.

Keyword: Determination, patulin, apple, HPLC

Abstract No: 480

Evaluation of nitrate and nitrite residues in meat products with spectrophotometric method in Hamadan, Iran

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Abstract

Background: In nature there is Nitrite in human environment such as in groundwater and in the structure of the human body and even in plants and animals. Of course nowadays since nitrite additives permitted in products and meat products to improve the red color of meat (by combining with Myoglobin and Hemoglobin). It is used to prevent the growth of bacteria such as clostridium as well as antioxidants and maintains the flavor of spices. It should be noted that the amount of nitrite in the meat products (according to the national standard 2303 with spectrophotometry method) is maximum 120ppm. Therefore, all food products such as meat products must be carefully tested and investigated to assure considering exact amount of additives.

Methods & Materials: In this study, 50 samples of different kinds of meat products (sausages) produced in this city have been studied and the nitrite remainder has been calculated by spectrophotometry method, and obtained results have been analyzed through Excel charts and determined equations.

Results: After measuring optical absorption rate for various amounts of sausages and calculating amount of sodium nitrite of each of products by spectrophotometry method, data showed that amount of sodium nitrite among this statistical set has been in range of statistical 134-95ppm. It has also been observed that difference between nitrite amount of meat products and meat percentages is not statistically significant; however difference of nitrite amount among different factories has been significant.

Conclusion: Considering the conducted study amount of residual nitrites in some cases is higher than the accepted limit in the country. Therefore, it is recommended to consider relevant standards and to regularly measure and control additives in meat products.

Keywords: Nitrite and Nitrate , Meat Products , Spectrophotometry method

Abstract No: 488

Seasonal effect on aflatoxin M1 contamination in raw and UHT milk from Tehran

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Abstract

Materials & Methods: Aflatoxin M1 contamination was examined in raw milk (3716) and UHT milk (706) samples collected from farms of Tehran and markets of central Tehran from February to July 2013. A maximal mean AFM1 of 1135.0 ng/L was measured in raw milk in March. The AFM1 levels exceeded the European Union maximum residue permitted amount (EU MRL) in 45.9% raw and 36.2% UHT milk samples in February.

Results: In total, AFM1 levels exceeded the EU MRL values in 27.8% of raw and 9.64% of UHT milk samples. A slight decrease in the number of samples exceeding the EU MRLs was recorded in the period March to June. The results showed significant statistical differences between the mean AFM1 concentrations of raw and UHT milk samples collected during February, March, May and June ($P < 0.05$, all). Also, statistical differences in AFM1 concentrations were found between months for raw and UHT milk ($P < 0.001$, both).

Conclusion: In conclusion, the frequency of control of feed and milk samples should increase and should strive to educate breeders and those involved in milk production about the harmful effect of aflatoxins to animal feed.

Keyword: UHT milk, Aflatoxins, raw milk

Abstract No: 494

Determination of Fusarium mycotoxins in wheat grain from khoramabad by HPLC

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Abstract

Background: Mycotoxins can appear in the food chain as a result of fungal infection of crops, either by being eaten directly by humans or by being used as livestock feed. Mycotoxins greatly resist decomposition or being broken down in digestion, so they remain in the food chain in meat and dairy products. Even temperature treatments, such as cooking and freezing, do not destroy some mycotoxins. These compounds have been implicated as the causative agents in a variety of animal diseases, such as, pulmonary oedema, infertility, diarrhoea, vomiting, anorexia, leukopenia, immunosuppression, skin and gastrointestinal irritation, hemorrhaging, etc., and have been associated to some human diseases. The IARC working group on carcinogenic risk to humans has classified the toxins derived from *Fusarium moniliforme* (including fumonisins) as possibly carcinogenic to humans (Group 2B). In this study the incidence of *Fusarium* in wheat samples from Khoramabad warehouses were investigated.

Methods & Materials: A total of 50 wheat samples (1 kg each) were randomly collected from all 10 warehouses of khoramabad province. After extraction of *Fusarium* from wheat flour samples with extraction solvent acetonitrile - water, toxin purification step was conducted using immunoaffinity columns. Samples were analyzed by HPLC using C18 column (250 mm × 4.6 mm ID, 5µm) with a fluorescence detector, mobile phase of acetonitrile-water (3:2 v/v) at flow rate of 1ml/min

Results: *Fusarium* was found in 68% of samples and 46 % of samples contained >200 µg/kg of this toxin.

Conclusion: Our results showed a high percentage and levels of contamination of wheat samples with *Fusarium* therefor there is need for regular screening for *Fusarium* mycotoxins in wheat grain.

Keyword: *Fusarium*, mycotoxins, Wheat

Abstract No: 292

Study on presence of Tartrazine as saffron adulteration in packed and spray saffron by HPLC-DAD

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Abstract

Background: Saffron is the most expensive spice used in industry, with many different uses as drug, textile dye and culinary adjunct. saffron is susceptible to adulteration, usually by adding other plant materials dyed with artificial colorants (e.g., tartrazine) to produce an increase in weight and yellow colour.

Materials & Methods: In this study A reversed-phase high performance liquid chromatographic method with diode array detector (DAD) for the determination of Tartrazine (E 102) as saffron adulteration in packed and spray saffron, was developed.

Results: The chromatograms of the methanol-water (50%, v/v) extracts of pure and adulterated saffron was obtained using a RP C18 column (5 µm) and a linear gradient from 20 to 80% methanol in water in 60 min with the flow rate of 1 ml/min at temperature 30°C and 4-nitroaniline as internal standard. one of the saffron components that responsible for its color (crocin) and the tartrazine added were detected and identified. Tartrazine (E 102) at 440 nm, crocin were determined at 440 nm and 4-Nitroaniline at 250, 310, 440nm. The method was validated in terms of sensitivity, linearity range, reproducibility, repeatability and analytical recovery.

Keyword: Saffron, Tartrazine, Adulteration, HPLC-DAD

Abstract No: 302

Validation data of a multiresidue analysis of some pesticides in olive oil using by gas chromatography mass spectroscopy (GC-MS)

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Abstract

Background: The widespread use of pesticides for improving agricultural productivity has raised public concern about the possible presence of residues in foods. Monitoring of pesticide residues is done to help ensure that pesticide applications are made in accordance with national and international guidelines. One of the consumable products in our country that produce traditional and manufacturing (domestic and imported) is olive oil, which also are used in food and drug industry. Identification of permissible limit of pesticides in olive oil is depends on control and monitoring of their residue in foods by validated analytical methods.

Materials & Method: In this study, a multiresidue analysis of 29 pesticides in olive oil by GC/MS were developed and validated. Sample preparations were done by QuEChERS method with extraction by acetonitrile and clean up procedure by surface absorbent compound such as PSA and C18. For eliminating of matrix effect, calibration curve were drawn by using of spiked samples in nine levels (n=3) with calculation of portion AUC of pesticide residue to AUC of internal standard (triphenyl methane (TPM)).

Result: Based on our validation results calibration curves are linear in rang of 10-1500 ng/g and r² were upper than 0.994. Average of recoveries of all pesticides in five levels (n=3) were in range between 77.97-112.65%, in terms of repeatability, the majority of the pesticides gave %RSD lowers than 20%. LOD and LOQ were 3-5 ng/g and 10-15 ng/g respectively.

Keyword: Pesticides; Olive oil; GC-MS; validation

Abstract No: 346

Determination of Aflatoxin M1 in breast milk and UHT milk samples in Tabriz

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Abstract

Background: Aflatoxins, produced by *Aspergillus* and *Penicillium* and found naturally in some of foods. Aflatoxin M1 (AFM1), the main monohydroxylated of aflatoxin B1 (AFB1) formed in liver and excreted in the milk. Aflatoxins were found to be one of the most potent groups of carcinogenic compounds and discovery of these properties initiated a widespread research on their concentrations especially in foods and foodstuffs. Contamination of breast milk and dairy products to aflatoxin M1 are a risk factor for infants.

Materials & Methods: In the present study, 30 samples of breast milk and 36 samples of ultra high temprature milk (UHT) from Tabriz prepared. The samples were analyzed using the enzyme-linked immunosorbent assay (ELISA).

Results: AFM1 was founded in breast milk of 2 out of 30 mothers (6.6%) at mean concentrations of 8.45 ng/l and 6 (16.6%) of 36 UHT milk samples at mean concentrations of 39.5ng/l. The concentration of AFM1 in none of the breast milk samples was higher than the maximum tolerance limit accepted by European Union (EU) (25 ng/kg) but in UHT milks 1 sample (2.7%) had the concentration above the limit permitted by EU (0.05 µg/L). These results emphasize for developing programmes to reduce aflatoxin in human and animal foods.

Keyword: Aflatoxin M1, Breast milk, UHT milk, Tabriz

Abstract No: 477

Aflatoxin M1 contamination in white cheese, butter and ice cream marketed in Iran during winter and summer

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Abstract

Background: Presence of aflatoxin M1 in dairy products could be a public health concern. The aim of this study was to determine the occurrence of AFM1 in popular dairy products (white cheese, butter, and ice cream) offered for sale in Iran.

Methods & Materials: In the present study, white cheese (72 samples), butter (31 samples) and ice cream (36 samples) were collected from popular markets in four large Iranian cities and examined for aflatoxin M1 (AFM1) by thin layer chromatography (TLC) technique.

Results: The toxin was detected in 59(81.9%) white cheese samples (mean: 0.297 µg/kg; range: 0.030–1.200 µg/kg), 8 (25.8%) butter samples (mean: 0.005 µg/kg; range: 0.013–0.026 µg/kg) and 25 (69.4%) ice cream samples (mean: 0.041 µg/kg; range: 0.015–0.132 µg/kg). The concentration of AFM1 in 30.5%, 9.6% and 27.7% of white cheese, butter and ice cream samples, respectively, were higher than Iranian national standard limits. Levels of AFM1 in samples of butter and ice cream collected in winter were significantly higher ($P < 0.05$) than those collected in summer..

Conclusion: The results indicated that the contamination of the dairy products in such a level could be a serious public health problem at the moment.

Keywords: Aflatoxin M1, Dairy products, Seasonal effect, TLC, Iran

Abstract No: 116

Study of The level of free radicals in egg yolk infected by common food pathogenic bacteria

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Abstract

Background: Food-born diseases are one of the common health problems in public health and hygiene issues. In this regard, bacteria in foodstuff are the most important agent of food-born disease. Because in addition their infectious effects, obligate aerobes have respiratory metabolism with oxygen as the terminal electron acceptor. Therefore, they can produce reactive oxygen species (ROS) and free radicals in contaminated food. Free radicals and stress oxidative have direct relation to degenerative and chronic disease. Malondialdehyde (MDA) is a product of lipid peroxidation which is used as an indicator of oxidative stress. The aim of this study was evaluated the level of free radicals that produced by two common food pathogenic bacteria in food stuff.

Method: Hence, to achieve this purpose the egg yolks as a source of unsaturated fatty acids were incubated with different dilution (105,106 and 107) of staphylococcus aureus -as a gram-positive pathogenic bacteria- and salmonella enteritidis-as a gram-negative pathogenic bacteria- and incubated at 37C for 20h. The level of MDA in egg yolk after incubation period was measured by TBARS test. In this test, samples solution mixed with 20% trichloro acetic acid. Thiobarbituric acid was added to the supernatant and the samples were heated in 90 C for 90 minutes. The absorbance of the supernatant was measure at 532 nm. The level of MDA was expressed in $\mu\text{g MDA/g}$.

Results: The level of MDA of high group (107) was $1.974(\mu\text{g MDA/g})$ in staphylococcus aureus and $1.658(\mu\text{g MDA/g})$ in salmonella enteritidis as compared with control ($0.909(\mu\text{g MDA/g})$).

Discussion: We concluded that common food pathogenic bacteria can induce oxidative damages in food staff addition to other problems, such as potent toxin production which is caused common food poisoning by these bacteria.

Conclusion: Consequently, heating food or using methods of sterilization cannot protect food stuff from all of the damages caused by the presence of pathogenic bacteria. As a result, it is necessary to use antioxidant compounds in food of animal origin.

Keyword: bacteria- free radicals-lipid peroxidation-egg yolk-stress oxidative

This research has been supported by Tehran University of Medical Sciences (TUMS) and Health Services grant (project no: 92-03-61-23242)

Abstract No: 62

The comparative assessment of Antioxidant Capacity and Anti-Inflammatory effect and flavonoids of Iranian and imported black tea with Green tea

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Abstract

Background: In the last years, has been growing interest in using foods for treatment and prevention of disease. The antioxidant, anti-inflammatory activity and total flavonoids of Iranian black tea, imported black tea with green tea were surveyed.

Methods & Materials: In this study, the antioxidant activity was surveyed by applying cupric ion reducing assay (cupric assay) at 450 nm and anti-inflammatory activity by inhibition albumin serum denaturation at 660 nm, and total flavonoids by approved methods.

Results: The antioxidant capacity and total flavonoids of Iranian black tea were 0.231 ± 0.03 and 0.0242 ± 0.0005 respectively. These amounts were more than green tea and imported black tea. The anti-inflammatory activity of green tea was considerable; 0.01 ± 0.001 . But in this regards the level of Iranian black tea more than imported black tea.

Conclusion: In this study, the nutrition values of Iranian black tea compared to imported black tea was significantly diagnosed.

Keyword: Antioxidant capacity, Anti-inflammatory effects, Total flavonoids, of Iranian and imported black tea, green tea

Abstract No: 20

Trace Toxic Metal Levels in Canned and Frozen Corn

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Abstract

Background: Monitoring programs for residues and contaminants contribute to improving food safety, warn of actual and potential food scares, and facilitate evaluation of possible health hazards by providing continuous information on levels of environmental pollution in the country. Food with levels of contaminants higher than those specified in the Annex to the Regulation should not be placed on the market. Inorganic Tin may be found in tinned food and canned drinks. It may provoke gastric irritation in certain susceptible groups of the population. For tinned foods other than beverages, the maximum level was laid down at 200 mg/kg.

Methods & Materials: The concentration of mineral and toxic heavy metals has been determined in 60 samples of canned corn and frozen sweet corn, for comparison in 2014. These samples (30 of them were canned corn and the rest were frozen) were collected from different local markets of Tehran, Iran. For reliable, accurate and precise measurements, Inductively Coupled Plasma - Atomic Emission Spectrometer (ICP-AES) has been used to quantify the levels of the studied metals in the studied samples after wet digestion in Pharmaceutical Sciences Branch, Islamic Azad University.

Results: The results obtained revealed that, the mean ranges of the elements analyzed in (mg kg⁻¹) between the frozen and canned food are as follows:

Pb (2.31 – 7.11), Zn (24.14 – 26.76), Cu (6.22 – 8.03), Ca (1611 – 8557), Mg (1669 – 1206), Na (9918 – 23787), Sn (35.21- 350.8) respectively. Some of the measured values found, not only relatively high in canned compared to frozen food samples, but also exceeds the international tolerance levels.

Conclusion: The monitoring of mineral and heavy metals in frozen and canned food samples is vital important challenge to control and improve the food industry strategies.

Keyword: Canned Corn, Toxic heavy metal, Contamination, Food Safety , Iran

Abstract No: 8

Neurotoxicity evaluation of 4 - methylimidazole using behavioral test including (open field) in NMRI mouse

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Abstract

Background: 4-Methylimidazole (4-MEI) is a compound used to make certain pharmaceuticals, photographic chemicals, dyes and pigments, cleaning and agricultural chemicals, and rubber products. 4-MEI is formed during the production of certain caramel coloring agents used in many food and drink products. It may also be formed during the cooking, roasting, or other processing of some foods and beverages. The purpose of this study was to evaluate the neurotoxicity effects of 4-methylimidazole using of in vivo experimental models

Methods & Materials: We used of behavioral tests including (open field) in NMRI male mice, as a model of evaluation neurotoxicity.. 4-methylimidazole or this vehicle (Saline) was injected oral by gavage for 14 consecutive days. Behavioral disorders were assessed fifteenth day. The results are expressed as mean \pm SEM and were analyzed using Graph Pad Prism software. One-way analysis of variance (ANOVA) followed by Dunnett's, Tukey's, or Bonferroni's were used for multiple comparison tests. For all analysis $P < 0.05$ was considered significant.

Results: Treatment with 4-methylimidazole during 14 days showed memory, motor functional impairment

Conclusion: 4-methylimidazole produced neurotoxicity in NMRI male mice.

Keyword: 4-methylimidazole, neurotoxicity, in vivo, NMRI mice

Abstract No: 541

Aspergillus spp. in rice imported to Iran- Bushehr

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Abstract

Background: Aflatoxins (B1, B2, G1 and G2) are secondary metabolites produced by *Aspergillus flavus* on a number of agricultural commodities, which can acutely cause some disorders such as, liver necrosis, bile duct proliferation, oedema or lethargy. Also, the International Agency for Research on Cancer has designated AFs as a human liver carcinogen. Rice (*Oryza sativa* L.) is the most important staple food crop in Iran and cultivated in different areas which have sultry and rainy climate. Since the amount of rice cultivation is not enough for domestic consumption, some country import rice from other regions such as India, Pakistan, Bangladesh and Thailand which are the largest producers of rice in the world, that some of these countries have frequent and heavy rainfall and floods in coastal areas particularly near harvest, under this climate the development of fungi, especially species of the *Aspergillus* and *Penicillium* is a common and unresolved problem. Thus, the rice imported to Iran ports as Bushehr, is usually examined for aflatoxins contamination. Therefore, the aim of the current study was to identify the levels of aflatoxin B1 and the total aflatoxins in imported rice to Bushehr port.

Methods & Materials: Aflatoxins analysis was performed by solvent extraction, immunoaffinity clean-up and determination HPLC equipped with post-column photochemical reactor and fluorescence detector that coupled to a KobraCell.

Results: In this study, among 100 samples analyzed, the rice samples collected from imported Iran via Bushehr port varied in AFB1 and total AF contamination; though, there were no samples with AFB1, and AFT above maximum tolerated level (MTL) (5, and 30 ng/g, respectively) performed by Institute of Standard and Industrial Research of Iran (ISIRI).

Keyword: Aflatoxin, *Aspergillus* spp., Rice, HPLC-FLD

Abstract No: 427

Determination of aflatoxin B1 in Baby Food collected from Iranian market using by HPLC with post-column photochemical derivatization

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Abstract

Background: Aflatoxin B1 is the most toxic mycotoxin which is harmful to human and animals. The International Agency for Research on Cancer (IARC) classified it as group I of human carcinogens. Previous studies suggested that Infants and young children are much more sensitive than adults to the toxic effects of aflatoxin B1. Therefore, European Commission set the maximum residue level 0.1 µg kg⁻¹ for AFB1 in baby food and processed cereal-based food (Regulation (EC) No. 683/2004).

Materials & Methods: In this study, for the first time we determined the amount of Aflatoxin B1 in baby food collected from Iranian market in 2015. The chromatographic condition was accomplished using a C18 column with an isocratic mobile phase consisting of water, methanol and acetonitrile. The sample preparation was done with simple extraction with water and methanol. Purification was carried out by immunoaffinity column cleanup and detection was done by post-column photochemical derivatization and fluorescence detector.

Results: The detection of AFB1 was carried out at λ_{exc} 365 nm and λ_{em} 435 nm. Our results showed that this method is reliable and useful for routine monitoring of aflatoxin B1 in baby foods.

Keyword: Aflatoxin B1, Baby Food, HPLC, Iran

Abstract No: 251

Analysis of the Mycotoxin Patulin in Apple Juice Using HPLC

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Abstract

Background: Patulin is a mycotoxin produced by a variety of molds, in particular, *Aspergillus* and *Penicillium* and *Byssochlamys*. Most commonly found in rotting apples, in general the amount of patulin in apple products is viewed as a measure of the quality of the apples used in production. In addition, patulin has been found in other foods such as grains, fruits, and vegetables. While not considered a particularly potent toxin, a number of studies have shown patulin to be genotoxic, which has led some to theorize that it may be a carcinogen, although animal studies have remained inconclusive. In this paper results of performed researches for patulin determination from apple juice, through high performance liquid chromatography are presented.

Material & Method: a total of 20 Apple Juice samples produced by five factories were collected and checked for the level of patulin using high performance liquid chromatography. Patulin analysis was performed according to the AOAC Official Method 995.10 (AOAC, 1995). Forty microliters of each sample were injected and eluted with a flow rate of 1.5 ml/min and a retention time of 15 min. The limit of detection was 10 µl/l.

Results: In this study 20 samples of apple juice investigated for patulin contamination. Results of the study showed that the levels of found patulin in 30% of apple juice was higher than Commission of the European Community.

Conclusion: Fungi growth and consequent patulin production may be influenced by storage conditions, and temperature control is one of the most important factors for the prevention of patulin contamination. Further studies of the effects of storage temperature and fruit quality on patulin production will guide the development of methods that reduce patulin in industrial apples prior to their processing.

Keywords: Patulin, Apple juice, HPLC

Abstract No: 234

HPLC Determination of Phenylalanine, Tyrosine and Tryptophan in Plasma, with Application for to patient with PKU

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Abstract

Background: Measurement of phenylalanine in plasma is required for the diagnosis and subsequent dietary management of phenylketonuria (PKU). We report the development of an isocratic high performance liquid chromatographic (HPLC) method for the measurement of phenylalanine, tyrosine and tryptophan concentration in plasma. Sample preparation is simple and rapid and analysis is speedy. We have used HPLC (Knauer PLATINblue) with diode array detector (DAD) and C18 analytical column (25 cm x 4.6 mm i.d) stainless-steel analytical column, packed with 5µm particles of Spherisorb octadecylsilane (ODS).

Materials & Methods: The mobile phase (20% acetonitrile in HPLC water (v/v) and 700µl perchloric acid per liter) was run at a flow rate of 2 ml/min. The mobile phase was thoroughly degassed under reduced pressure before use. 100µl of plasma were pipetted into a 1.5-mL polypropylene micro tube and 1ml working internal-standard/protein-precipitant solution (α-Methyl-D-phenylalanine 5mg/dl and 0.59 mol/L perchloric acid) was added, vortex-mixed for 30 s. Incubation for 15 min in refrigerator before centrifugation. Standard and control was carried out in the same way. 20µl from upper layer is injected into the column. Tyr, Phe and Trp were determined in the ultraviolet detector at 214 nm. The determination was within 5.0 min.

Results: The resulting curve for signal vs concentration was linear between 0.16 and 50 mg/dl. The detection limit was 0.01 mg/dl. Analytical recovery was 96.5% and precision 2.80% for Phe.

Conclusions: The method we developed is simple, rapid and convenient. It is useful for diagnosis and treatment of PKU in newborns and children.

Keywords: High performance liquid chromatography, Phenylalanine, Phenylketonuria, Tyrosine

Abstract No: 225

Multiresidue analysis of some pesticides in milk based infant formula

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Abstract

Background: Dried milk-based formulas are the most common foods included in infants' diet, which very often constitute the only food consumed during their first months of life. Infant formulas are manufactured from dried hydrolysed cow's milk, so, special attention must be paid to their possible contamination from pesticide residues that could be present in the raw materials. In this study an efficient method for the multiresidue analysis of 17 pesticides in milk based infant formula has been developed. The method which used in this study is QuEChERS (Quick, Easy, Cheap, Effective, Rugged and Safe) sample preparation method and the device that was selected for analyzing the pesticides was GC/MS. N-hexane was used as the fat retainer and PSA and C18 were used for cleanup steps.

Results: Results of validation showed that the recovery of pesticides at 5 concentration levels (n=3) were in range of %78.9-119.2 and the %CV was lower than 20%. The number of 47 samples from different brands were collected from drugstore in Tehran. as a result, 4% of the samples were polluted with Beta HCH and it was between LOD and LOQ.

Keyword: Infant formula, GC/MS, QuEChERS, Pesticides

Abstract No: 446

The Inhibitory effect of levamisole on lactoperoxidase activity in caprine milk

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Abstract

Background: Toxic effects are a common response to many physiologically active substances including anthelmintics. Levamisole was originally used as an anthelmintic to treat worm infestations in both humans and animals. Lactoperoxidase (EC 1.11.1.7) is a glycoprotein that occurs naturally in colostrum, milk, and many other human and animal secretions. It contributes to the nonimmune host defense system, exerting bacteriostatic and bactericidal activity mainly on gram negative bacteria. In this study, effect of different concentration of levamisole on lactoperoxidase activity in caprine milk was examined.

Methods & Materials: After preparation of skim milk, lactoperoxidase enzyme activity was assayed in the absence (control) and presence of different concentration of levamisole (1- 1000 μ M) using H₂O₂ and 2, 2-azino-bis (3-ethylbenzothiazoline-6-sulphonic acid) as substrates.

Results: Result show that the enzyme activity decreased gradually by increasing concentration of levamisole from 30 μ M up to 1000 μ M. The half maximal inhibitory concentration (IC₅₀) value of levamisole was 100 μ M.

Conclusion: Results suggest that the use of levamisole may decrease the lactoperoxidase activity in caprine milk during lactation. Therefore, when this drug is required during lactation, the dosage should be carefully determined to decrease the side effects.

Keyword: caprine milk, lactoperoxidase, levamisole.

Abstract No: 442

Aflatoxin M1 contamination in pasteurized milk and yoghurt marketed in Iran during winter and summer

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Abstract

Background: Aflatoxin M1 (AFM1), known as milk toxin, is the principle hydroxylated product of AFB1, metabolized by cytochrome P450-associated enzymes in liver and appear in milk of lactating animals following consumption of AFB1 contaminated ration. Presence of aflatoxin M1 in milk and dairy products is hazard for public health due to the toxic and carcinogenic effects of the toxin. The aim of this study was to determine the occurrence of AFM1 in popular dairy products offered for sale in Iran.

Methods & Materials: In the present study, 159 dairy product samples consisting of pasteurized milk (91 samples), yoghurt (68 samples) were collected from popular markets in four large Iranian cities (Tehran, Esfahan, Shiraz and Yazd) during winter and summer, and examined for aflatoxin M1 (AFM1) by thin layer chromatography (TLC) technique.

Results: AFM1 was detected in 66 (72.5%) pasteurized milk samples (mean: 0.052 µg/l; range: 0.013–0.250 µg/l), and 36.2% of the samples had AFM1 in excess of the maximum tolerance limit (0.050 µg/l). The toxin was detected in 45 (66.1%) yoghurt samples (mean: 0.032 µg/kg; range: 0.015–0.119 µg/kg), and 20.6% of the samples had levels of the toxin above the Iranian legal limit (0.050 µg/kg). Levels of AFM1 in samples of pasteurized milk and yoghurt collected in winter were significantly higher ($P < 0.05$) than those collected in summer.

Conclusion: Results of the present study showed that the level of the toxin in examined samples is a serious problem for public health at the moment.

Keyword: Aflatoxin M1, pasteurized milk, yoghurt, thin layer chromatography

Abstract No: 421

Determination of aflatoxin M1 in traditional dairy products in west part of Iran during winter and summer

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Abstract

Background: Aflatoxins are a group of highly toxic metabolites of molds mainly produced by toxigenic strains of *Aspergillus flavus*, *Aspergillus parasiticus* and *Aspergillus nomius* that cause dangrouse complications.

Methods & Materials: This study was undertaken to determine the occurrence of aflatoxin M1 (AFM1) contamination in 360 dairy product samples consisting of raw milk of cow, goat and sheep; traditional cheese; yoghurt ;Kashk; Doogh and Tarkhineh samples collected from west part of Iran(Kermanshah,Hamedan,Ellam,Sanandaj) in both winter and summer seasons. Enzyme-linked immunosorbent assay) ELISA (technique was used for analysis of the samples.

Results: Results showed that ,seasonal variations influenced the concentration of AFM1 in most of the analyzed dairy products.The aflatoxin was detected in 84.3% raw cow milk samples (mean: 59.3 ng/kg; range: 6.1-188.2 ng/kg), 44.6% raw goat milk samples(mean33.6 ng/kg; range: 8.9–81.7 ng/kg),65.3% raw sheep milk samples(mean: 42.1 ng/kg; range: 5.7-8.2 ng/kg),23.8 % yoghurt samples(mean: 158.4 ng/kg; range: 52.5–272 ng/kg), 65.5%cheese samples(mean: 15.1 ng/kg; range: 6.3–21.3 ng/kg), 35% Kashk samples(mean: 62.1 ng/kg; range: 51.7-80 ng/kg),13.6% Doogh samples(mean: 9 ng/kg; range: 7–12.1 ng/kg) and 35% Tarkhineh samples(mean: 11 ng/kg; range: 8.2–16.6 ng/kg. The concentration of AFM1 in 35.9%, 11.1%, 26.9%, 10% and 27.7% of raw cow milk, raw goat milk, raw sheep milk and cheese samples, respectively, were higher than Iranian national standard limits. Levels of AFM1 in samples collected in winter were significantly higher ($P < 0.05$) than those collected in summer.

Conclusion: The finding of this study and other studies show that dairy product in Iran have high contamination of aflatoxin M1 which can threat public health.More surveillance and control of animal feeding and dairy products factories can led to reduction of contamination with this mycotoxin in dairy products.

Keyword: Aflatoxin M1, traditional dairy product, ELISA

Abstract No: 417

Total aflatoxin in animal feed stuff in Khorasan Razavi Province, Iran

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Abstract

Background: Aflatoxins (AFs) are the best known and most widely studied mycotoxins. AFs are injurious to the human, livestock and poultry. Adverse effects of AFs include growth impairment, decreased resistance to pathogens, hepatotoxicity and nephrotoxicity.

Methods & Materials: From March 2014 until February 2015, 794 samples from three different feed stuffs (cottonseed meal, wheat bran and barley) were examined. Samples were collected from farms and analyzed for total aflatoxin using ELISA. In the barely samples, Aflatoxin amounts of 25 samples (5.66%) were lesser than 10 µg/kg and 416 samples (94.34%) were not contaminated. In the cottonseed meal samples, total aflatoxin of 38 samples (13.1%) was measured between 10 to 20 µg/kg, 219 (75.7%) samples were contaminated with lesser than 10 µg/kg and 32 samples (12.2%) were not contaminated. Also, in wheat bran samples, 19 samples (29.7%) were contaminated with lesser than 10 µg/kg and 45 samples (70.3%) had not any aflatoxin contamination.

Results: Total aflatoxin of all samples was found lesser than Maximum Residue Level (MRL) recommended by FDA (20µg/kg).

Conclusion: Finally, this study shows good condition of feed stuffs in Khorasan Razavi Province.

Keywords: Total aflatoxin, Elisa, feed stuff

Abstract No: 410

Evaluation of Aflatoxin M1 in Raw Milk and pastry Creams in Qazvin

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Abstract

Background: Aflatoxin M1 (AFM1) is the principal hydroxylated aflatoxin metabolite present in the milk of dairy cows fed a diet contaminated with aflatoxin B1 (AFB1), the toxic effects of AFM1 include carcinogenesis, reduced protein synthesis, and immunosuppressant effects. The aim of this study was to determine the levels of aflatoxin M1 in milk and pastry creams of Qazvin.

Methods & Materials: 150 raw milk samples from local shops, Dairy industry and traditional farms; and 75 pastry creams were collected from 25 confectionaries of Qazvin city. These samples were analyzed for aflatoxin M1 by ELISA competitive technique. The AFM1 incidence rates in milk and creams were 62.6% (94 samples) and 73.3% (55 samples), respectively. Average AFM1 concentration in raw milk was 0.118 ng/ml and in cream was 0.317 ng/g.

Results: Results were compared with the Iranian National Standards Organization permissible levels of aflatoxin M1 in milk (0.1 ng/ml) and milk products (0.1 ng/g). Contamination level in 26 milk (27.65%) and 38 creams (69.09%) of contaminated samples were higher than these levels. No positive correlation was observed between the level of AFM1 in milk and the level of AFM1 in cream samples, which was likely caused by the large variations in milking and Creams processing.

Conclusion: The results indicated that the community is constantly exposed to these toxins. Regulatory mechanism should be implemented to control the toxins in milk and milk products. As feed is the main source of AFM1 in milk the level of aflatoxins in livestock feeds should also be kept to the minimum.

Keywords: Aflatoxin M1, Milk, Pastry Cream, Elisa

Abstract No: 361

Aflatoxicosis in *Litopenaeus vannamei* white shrimp

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Abstract

Background: Aflatoxins are one of the most studied mycotoxins. Because of their common occurrence in feedstuffs and feeds, they pose a severe threat to humans and animal. Many outbreaks of acute and chronic disease have been attributed to consumption of aflatoxin-contaminated foods. The most significant effect of aflatoxin in farm animals is hepatotoxicity. Reports on the toxicity of AFB indicate that aflatoxicosis is a potentially serious Problem in shrimps.

Materials & Method: In current study, determination of AFs levels in extracted farmed white shrimp tissues and their diet samples from Helleh, Delvar, Mond, Bandar Rig sites in Bushehr province was carried out by isocratic reverse-phase liquid chromatography (HPLC).

Result: Results showed that, the highest level of aflatoxin, among all groups was 4.12ppb and Related to mond food sample. Notwithstanding the differences between all groups of individual aflatoxines, there is only one significant difference in groups of AFG1 (P-value= 0.031).

Conclusion: In conclusion, Authors suggest the aflatoxins regular testing on foods to prevent contamination.

Keyword: Aflatoxicosis, shrimp, HPLC, Bushehr.

Abstract No: 346

Determination of Aflatoxin M1 in breast milk and UHT milk samples in Tabriz

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Abstract

Background: Aflatoxins, produced by *Aspergillus* and *Penicillium* and found naturally in some of foods. Aflatoxin M1 (AFM1), the main monohydroxylated of aflatoxin B1 (AFB1) formed in liver and excreted in the milk. Aflatoxins were found to be one of the most potent groups of carcinogenic compounds and discovery of these properties initiated a widespread research on their concentrations especially in foods and foodstuffs. Contamination of breast milk and dairy products to aflatoxin M1 are a risk factor for infants.

Materials & Methods: In the present study, 30 samples of breast milk and 36 samples of ultra high temprature milk (UHT) from Tabriz prepared. The samples were analyzed using the enzyme-linked immunosorbent assay (ELISA).

Result: AFM1 was founded in breast milk of 2 out of 30 mothers (6.6%) at mean concentrations of 8.45 ng/l and 6 (16.6%) of 36 UHT milk samples at mean concentrations of 39.5ng/l. The concentration of AFM1 in none of the breast milk samples was higher than the maximum tolerance limit accepted by European Union (EU) (25 ng/kg) but in UHT milks 1 sample (2.7%) had the concentration above the limit permitted by EU (0.05 µg/L).

Conclusion: These results emphasize for developing programmes to reduce aflatoxin in human and animal foods.

Keyword: Aflatoxin M1, Breast milk, UHT milk, Tabriz

Abstract No: 53

Zearalenone up-regulates Estrogen receptor β transcriptionally and translationally in the testis of rats

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Abstract

Background: Zearalenone as a mycoestrogen is found in corn, corn products, rice, wheat and other food and feedstuffs. Its estrogenic effects mainly related to binding to estrogen receptors (ERs). There are plenty of reports about Zearalenone estrogenic effects in female reproductive system, however relatively little data could be found on the effect of this mycoestrogen on male reproductive system. In this study we aimed to highlight the effects of zearalenone at various dose levels on the expression of estrogen receptor β in the testis of adult rats.

Methods & Materials: To achieve this goal, 30 mature male rats were assigned into five groups as; control (0.3mL saline, i.p.), ZEA-received (1, 2 and 4 mg/kg, b.w., i.p.) and 17 β -estradiol-received (0.1 mg/kg, i.p.). Following 28 days, the mRNA levels of ER α and ER β and the expression of them at protein levels in testicles were evaluated by using PCR and Immunohistochemical (IHC) analyses, respectively. Zearalenone down-regulated the mRNA and protein levels of ER α in testicles while up-regulated the ER β expression.

Results: The E2-received group exhibited no significant changes at mRNA and protein levels of ER α and ER β in testes. Our data suggest that zearalenone exerts its effects on the testis via up- and down-regulation of estrogen receptor β and α respectively.

Keyword: Estrogen receptors; Male reproductive system, Zearalenone

Heavy Metal & Carcinogens

Abstract No: 174

Combinational effect of arsenic trioxide and cisplatin on proliferation of gastric carcinoma cells

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Abstract

Background: anti-cancer effect of arsenic trioxide (ATO) is being increasingly studied during the recent years. Regarding the side effects of cisplatin and resistance of cancer cells to this therapeutic agent, we aimed to appraise the effect of ATO on cisplatin effect in gastric carcinoma cells.

Materials & Methods: MTT assay and flow cytometry were carried out to appraise the effect of ATO on cell viability and apoptosis respectively. Gene expression of Akt and mTOR was measured using real-time PCR. All the experiments were performed in triplicate and the data are shown as mean \pm SD. Statistical significances of difference throughout this study were calculated using a Student's t-test and by one-way variance analysis. P values <0.05 were considered significant.

Results: ATO and cisplatin decreases viability of MKN45 gastric cancer cell line when used alone. Moreover, the combinational use of ATO and cisplatin synergistically decreased viability of MKN45 gastric cancer cell line which suggests that ATO sensitizes MKN45 cells to cisplatin effect. ATO also suppresses expression of Akt.

Conclusion: Regarding the fact that PI3K/Aktsignaling pathway is highly involved in resistance of gastric cancer cells to anticancer agents, we hypothesize that the synergistic effect of ATO and cisplatin could be mediated through their cooperation in suppression of Akt. Hence ATO, in combination with cisplatin, could be a potent agent to target gastric cancer. This combination could increase efficacy of cisplatin and result in less toxic doses of cisplatin for the treatment of gastric cancer.

Keyword: arsenic trioxide (ATO), cisplatin, gastric carcinoma, Akt

Abstract No: 172

Primary chronic copper poisoning with high fatality in Sonqr and Kolyaee of Shahr-e-sonqr Kermanshah province

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Abstract

Background: Copper (Cu) is an essential trace mineral that is vitally important for physical and mental health. But due to wide spread occurrence of copper in our food, hot water pipe, nutritional deficiencies tablet and birth control pills increases chances of copper toxicity. Sometime in December 2014 the cause of heavy mortality of sheep in Shahr-e-sonqr Kermanshah province was studied. In case history the affected animals had blood colored urine icterus and progressive emaciation. The clinical symptoms of affected sheep were normal to mild hyperthermia, tachycardia with intensified sound, normal to tachypnea with pathologic sound in a patient, non-qualified rumen activity, normal to diarrheal defecation, weakness to lateral recumbency and paleness to icterus of visible mucous membrane.

Methods & Materials: Macroscopic pathology findings in very weak and moribund slaughtered animals were: Icteric liver, big gall bladder with dark green content and yellowish internal surface, large and less consistent spleen, darkened and blue gritty sediment of kidney surface, less consistent lymph node with yellowish periphery and dark center on cut surface. Histopathological findings were as follow: Granular degeneration, increased kupffer cells with abundant ceroid like pigments, single cell necrosis and apoptosis of hepatocytes, large amount hemosiderin sedimentation in spleen, very many hyaline casts in the lumens of urinary proximal tubule and hyaline droplets in cytoplasm of the epithelial cells of these tubules. Average amount of Cu in soil, plant, liver, kidney, spleen, heart, lung, brain, rumen content, intestinal content, fat, muscle, urine, milk and blood were 1572.87, 5125.9, 839.22, 16.76, 25.57, 12.51, 20.1, 11.35, 96.5, 28.77, 15.32, 7.07, 7.03, 6.15 and 49.45 ppm respectively. Each flock was mixed of sheep and goat and accompanied by a donkey. Till the time of this study no goat and donkey affected with this disease. The mean of Cu in goat and a donkey serum of an engaged herd were 4.07 and 3.68 ppm respectively.

Keyword: Sheep, Heavy mortality, Copper poisoning, Blood colored urine, Icterus, Gritty kidney

Abstract No: 166

Behavioral deficits induced by lead exposure are accompanied by serotonergic and cholinergic alterations in the prefrontal cortex

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Abstract

Background: The effects of long-term lead (Pb) exposure producing a blood Pb concentration of lower than 20 µg/dL, i.e. below that associated with overt neurological deficits in occupationally exposed individuals, was studied in adult rats.

Methods & Materials: In order to assess gender differences, we performed parallel behavioral experiments in male and female rats. Exposure to Pb acetate (50 ppm in drinking water) for 6 months induced motor and cognitive alterations, however these effects were gender- and task-dependent. Chronic lead exposure impaired spatial learning assessed in the Morris water maze test (MWM) in both genders, whereas it only induced hyperactivity in the open field and impaired motor coordination in the rotarod test, only in male rats.

Results: Hyperactivity in male rats was accompanied by an increase in extracellular level of acetylcholine in the prefrontal cortex. Extracellular dopamine concentration in the prefrontal cortex was unaffected by lead exposure whereas serotonin concentration in the same brain area was significantly decreased in both male and female rats exposed to lead.

Conclusion: These results unveil new molecular mechanisms underlying neuropsychiatric alterations induced by chronic lead exposure.

Keyword: Cognitive deficits, Gender bias, Brain Pb concentration, Extra-neuronal neurotransmitter

Abstract No: 147

The Effect of lead poisoning on changes of mood or anxiety manner in Wistar rats of both genders

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Abstract

Background: Neurotoxicity describes neuropsychological changes caused by exposure to toxic agents. Among heavy metal exposures, lead exposure is one of the most common exposures leading to a significant neuropsychological and functional decline in humans. The aim of this research was to investigate the effect of lead poisoning on changes of mood or anxiety manner in wistar rats of both genders.

Material & method: In this study, 20 male and 20 female wistar rats weighing 180-200 gr were used. Each group was divided into two experimental and control sub-groups. 500 PPM Lead acetate Pb(OAC)₂ salt was added to water used in experimental groups for 30 days. The anxiety level of each individual animal in four groups under study was tested using the Elevated plus-maze test. Data in the form of Mean \pm SEM were analyzed using Non- paired t-test, and the significant level of $P < 0.05$ was considered.

Results: Time spent in the closed arms for females in the control group and in the experimental group was (1.3 \pm 0.2 min) and (2.4 \pm 0.3 min) respectively, but for the males in the control group was (1.2 \pm 0.4 min) and in the experimental group was (2.8 \pm 0.4 min).

Results : The amount of lead exposure in the experimental group compared to that of the control group of both genders resulted in an increase in the presence of the closed arms, and This difference was significant in both genders ($P < 0.05$). Comparison of male and female experimental groups indicates that the time spent in the closed arms, although more in males than in females was not statistically significant ($P > 0.05$).

Conclusion: The results show that exposure to lead can cause an increase in anxiety level of both genders, and this effect may be greater in males.

Keywords: Neurotoxicity, Heavy metal, Lead, Anxiety manner, Gender, wistar rats

Abstract No: 227

Histological and histometrical alterations of the gill and kidney of rainbow trout (*Oncorhynchus mykiss*) exposed to mercuric chloride

Ali Louei Monfared, Ali Mohammad Basati, Maryam Bastami

Abstract

Background: Mercury occurs naturally in the environment and exists in several forms. It has been demonstrated that mercuric salts could accumulated in the fish organs. Also, some people may be exposed to higher levels of mercury if they have a diet high in fish that come from mercury-contaminated waters.

Methods: These studies investigate the effects of mercury on histology of gill and kidney in rainbow trout. So, thirteen fingerlings *O. mykiss* were exposed to concentration of 0.1, 0.5 and 1 mg/kg mercuric chloride for 30 days. At the end of study, tissue samples were taken and histological changes were recorded.

Results: In the gill tissues of the exposed fish; aneurism in the secondary lamellae of gills, hyperplasia of epithelium of gills as well as the adhesion of the gill lamellae was seen. Also, treating with mercury could induce hyaline cast formation, significant decreasing in the glomerular diameter and also formation of intra cytoplasmic vacuoles in the various urinary tubules.

Conclusion: This study showed that mercuric chloride induces gill and kidney damage in the *O. mykiss* juveniles and its effects is dose-dependent.

Keyword: Gill, Kidney, Histology, mercury, Rainbow trout.

Abstract No: 204

Cadmium Contamination of Cow Raw Milk in Khoy Region (Northwest of Iran)

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Abstract

Background: Milk is a good source for protein, fat and minerals. The presence of heavy metals in milk is a major health problem for the milk consumers. Heavy metals especially cadmium has toxic effect on humans and animals.

Materials & Method: For this study 100 cow raw milk samples were collected randomly from bulk milk collection centers and dairy stores in Khoy region from October to November 2014. Cadmium content in milk samples detected by Fast Sequential Atomic Absorption Spectrometer (Varian). The mean value of cadmium was 2.69 ± 0.59 µg/L. The maximum tolerance limit accepted by FAO/WHO for cadmium in milk is 10 µg/L. Of all samples 6% was greater than the maximum tolerance limit.

Result: This is the first report of lead contamination in cow raw milk in khoy region. A continuous cadmium monitoring system suggested to control the concentration of cadmium in cow raw milk in Khoy region.

Keyword: Cadmium, Milk, Khoy, Iran

Abstract No: 242

Ellagic acid countracts arsenic toxicity on isolated rat mitochondria: An implication for arsenic associated disorder preventive

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Abstract

Background: The aim of this study was to assess the protective effect of ellagic acid against toxicity induced by arsenic in isolated rat liver mitochondria.

Materials & Methods: Arsenic at the concentration of 20, 40 and 100 μM increased ROS level and mitochondrial dysfunction in mitochondria led to reduced mitochondrial total dehydrogenase activity. When pretreated mitochondria with ellagic acid (20, 40, 80 μM) were exposed to arsenic, at all concentrations, ROS production and mitochondrial damage were reversed.

Results: Our results showed that mitochondria were significantly affected when exposed to arsenic, forcedly directed toward excess ROS production and mitochondrial membrane disruption. Pretreatment with ellagic acid, reduced ROS amounts, mitochondrial damage and restored total dehydrogenase activity specially complex II.

Conclusion: These findings suggest a potential role for ellagic acid to treat or prevent the mitochondrially associated disorders.

Keyword: Mitochondria, Arsenic, Ellagic acid, Rotenone

Abstract No: 240

Berberine counteracts arsenic induced mitochondrial damage: potential implication for diabetes treatment

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Abstract

Background: The aim of this study was to assess the protective effect of berberine against toxicity induced by arsenic in isolated rat liver mitochondria.

Methods: Mitochondria were prepared from rat's liver by differential centrifugation. The level of reactive oxygen species generation and mitochondrial membrane potential changes were evaluated spectrofluorometrically.

Results: Arsenic at the concentration of 20, 40 and 100 μM increased ROS level approximately 13.5 %, 21.3 % and 29% respectively. When pretreated mitochondria with BBR (10, 25, 50 μM) were exposed to (20, 40 and 100 μM) arsenic, at all applied concentrations could diminished ROS production. Arsenic at the concentration of 20 μM increased mitochondrial damage approximately 2.5 % as compared to control. When mitochondria were exposed to 40 μM arsenic, their damage elevated 4.8 % whereas 100 μM arsenic increased mitochondrial damage to 7.26%. When mitochondria were pretreated with berberine (10, 25, 50 μM) and then exposed to different concentrations of arsenic, results showed that berberine at all concentration could not restore the membrane potential to the control level.

Conclusions: Our results showed that mitochondria were significantly affected when exposed to arsenic, forcedly directed toward excess ROS production and mitochondrial membrane disruption. Pretreatment with berberine, reduced ROS amount and mitochondrial damage induced by arsenic. These findings suggest a potential role for berberine to treat or prevent the mitochondrially associated disorders.

Keyword: Mitochondria; Arsenic; Berberine; Reactive Oxygen Species

Abstract No: 476

Evaluation of Heavy metals, Nitrate and Nitrite in Tap Water of Mashhad, Iran

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Abstract

Background: Heavy metals, nitrite and nitrate in drinking water are harmful to human health. The water sources may be contaminated by these toxic chemicals. It was thus aimed to access their concentrations in tap waters of Mashhad city.

Methods & Materials: Fifty tap water samples obtained from different geographical locations in Mashhad on 2-5 March 2013. Mercury (Hg), lead (Pb), aluminum (Al), chromium (Cr), cadmium (Cd) and arsenic (As) concentrations were determined by an atomic absorption spectrometry using mercuric hydride system and heated graphite atomization techniques. Determination of the water nitrite and nitrate concentrations was carried out by UV-VIS Spectrophotometry. All determinations were performed in the Toxicology laboratory of the Center.

Results: The water concentrations of Cd (0.93 µg/L), Cr (27.09 µg/L), Hg (4.20 µg/L), as (1.43 µg/L), Pb (4.43µg/L) were below the WHO permitted level. In three samples of the water, Al concentrations were higher than the WHO standard of <200 µg/L; the highest was 328.1 µg/L, but the mean concentration was below the value. Nitrate and nitrite concentrations in all of tap water samples were well below the maximum permitted level of the WHO Guidelines 2006 and Australian Drinking Water Guidelines 2011.

Conclusion: All the heavy metals and the anion concentrations in the Mashhad tap water samples were below the standard level of WHO, except for three aluminum samples which were higher than the standard of 200 µg/L. Due to seasonal and the other environmental changes, regular assessment of tap water quality is recommended.

Keywords: tap waters -Heavy metals-concentration

Abstract No: 392

Pathological changes in the tissues of rats (albino) in zinc sulfate and zinc chloride toxicity

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Abstract

Background: This study aimed to investigate the effects of intraperitoneally injected zinc sulfate and zinc chloride in development tissue lesion.

Materials & Method: Adult male Wistar rats (weighting 200 ± 20 gr) were randomly divided into groups: control (receiving saline %0.9), zinc sulfate(10,20,30,40 mg/kg/day) and zinc chloride(7,14,21,30 mg/kg/day). Daily observations were made and at weekly interval day 7,14,21,28 from each treatment dose, 5 rats were sacrificed and examined grossly and histologically. Organs of interest were the brain, liver, kidney, pancreas, spleen and heart. Histologic sections were prepared and stained with Hematoxilin and Eosin.

Results: On histological examination, pancreatic lesions are the outstanding and very prominent in both zinc sulfate and zinc chloride toxicity. Zinc sulfate administration caused necrosis in kidney, pancreas, liver, spleen, brain and heart. In zinc chloride administration hemorrhage in all organs was prominent and Infiltration of inflammatory cells was seen.

Conclusion: It seems that pathologic lesion with Zinc compounds is linked with dose and duration of exposure. Higher doses in both zinc sulfate and zinc chloride causing severe damage and even death, but these effects are more severe with zinc chloride and causes of death in the first few weeks.

Keywords: zinc sulfate, zinc chloride, toxicity

Abstract No: 13

Phytoremediation study on different concentrations of soil Lead (Pb) to uptake cadmium (Cd) element in different organs of Eucalyptus camadulensis

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Abstract

Background: Soil contamination is one of the main reasons of disturbance in nature balance. Purpose of recent research was investigation on uptake and bioaccumulation ability of Eucalyptus camadulensis plant species also interaction between Lead and Cadmium uptake inside root and leaf of Eucalyptus camadulensis.

Methods & Materials: Phytoremediation is used for clean up the polluted soils with mineral and organic contaminants during recent decades. Decreasing heavy metals and contaminants inside polluted soils and tolerance of plant is vital and crucial for this purpose. In this research glass house under certain condition and controlled environment 3 different treatments of Lead (Pb) applied during Eucalyptus camadulensis growing and after growth sampling were done from root and stem. Samples after preparation are ready to measure and analysis with Induced coupled Plasma (ICP) instrument. Experiment is based on Completely Randomized design and statistical analysis used the SPSS software.

Results & Conclusion: Results showed that variety and concentration of Heavy metals of soil are affecting on rate of uptake and accumulation also place of Cadmium accumulation in different organs of Eucalyptus camadulensis.

Keyword: soil pollution, Eucalyptus, uptake rate, Heavy Metals, interaction.

Abstract No: 535

Cadmium, nickel and lead in *Zataria multiflora* prepared from local market of Kerman using atomic absorption spectrophotometry

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Abstract

Background: The use of medicinal herbs to relieve and treat human diseases is an age old practice. Depending upon the geographical sources of the herbs, sometimes the trace and heavy metals' content may differ, which may lead to severe toxicity. So, the toxicological and safety assessment of these herbal drugs are one of the major issues in recent days. *Zataria multiflora* is a thyme-like plant that grows wild in central and southern Iran. It is a member of the Labiatae family to which mint, rosemary and several other useful medicinal plants also belong. In Iran, *Zataria multiflora* is used in traditional folk remedies for its antiseptic, analgesic (pain-relieving) and carminative (antiflatulence and intestine-soothing) properties. However, its composition has not been published yet. The main aim of this research was to determine the toxic metals including cadmium, lead and nickel in the raw plant parts, residue on ignition and aqueous extract of *Zataria multiflora*.

Methods & Materials: *Zataria multiflora* from various origin were purchased from local market in Kerman, were washed thoroughly with water and dried at room temperature and grounded into coarse powder for extract preparation. The plant material was authenticated from pharmacognosy department of pharmacy faculty, Kerman. The powdered material was extracted with distilled water by maceration, filtered using filter paper and extract was vacuum evaporated at 40°C. In addition the residue on ignition was prepared by placing the powdered sample in an oven at 500°C for about two hours and then the residue was reconstituted in the acid media. Cd, Pb and Ni were measured by atomic spectrophotometry.

Results: Results showed that all the three heavy metals were detectable in all of the samples, but it should be evaluated for its safety based on its total weekly intake. The amount of the elements in three different types of the samples including raw material, residue of the burned material and extract were different which can be concluded that some processes such as washing and peeling will affect the heavy metal contents of the medicinal herbs.

Keywords: Cadmium; Lead; Nickel; *Zataria multiflora*

Abstract No: 43

Metal mobility in laboratory-contaminated (spiked) sediments used for the development whole-sediment toxicity tests

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Abstract

Background: Four river bed sediments with varying properties were artificially contaminated with Cadmium (Cd), Copper (Cu), Nickel (Ni) and Zinc (Zn) then subjected to drying and rewetting to study the competitive binding and release of metals that may occur due to varying river water levels.

Materials & methods: Sediment samples were collected from 0-10 cm depth of Abshineh River during dry season. The sediments were spiked with 400 mg Zn kg⁻¹, 200 mg Cu kg⁻¹, 200 mg Ni kg⁻¹, and 50 mg Cd kg⁻¹. Leaching column experiment was conducted on four metal-spiked sediments to determine the degree of mobility. The distribution of metals in different fraction was evaluated by sequential extraction before leaching.

Results: The four metals were separated into two classes according to their leachability. In clayey columns: more mobile metals like Zn, Ni, and Cd that were immobile, and more immobile metals like Cu that were quite mobile in clayey texture, except Ni mobility in one of the clayey sediments. Copper leachability was higher for the sediments with finer grain size and higher organic matter content, indicating that both pore distribution and the presence of organic complexes and colloidal forms was likely to have had major role in this metal mobility. The mobility of Zn and Cd are strongly governed by pH, where the mobility of Cd is typically much greater than Zn in more acidic sediments. The metal addition caused the displacement of Ca, Mg, K, and Na. which subsequently leached from sediment columns.

Conclusions: Despite the spiking of inorganic metals into the sediments and drying before leaching, the mobilization of metals with deionised water (to mimic rainwater) was small in the different sediments relative to the total amounts of each metal added. This would indicate that the majority of the added metals were likely to be bound in forms that exhibit a low potential for release to the environment and low bioavailability to organisms.

Keywords: Metals sediments toxicity tests.

Abstract No: 23

Contamination of Trace Toxic Metal in Green Peas Products

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Abstract

Background: The subject of heavy metals is receiving increasing scrutiny in food industry due to increasing incidents of contamination in agriculture and industrial sources. Metals like iron, copper, zinc, cobalt and manganese are essential metals since they play an important role in biological systems; whereas mercury, lead, cadmium, etc. are non-essential metals which can be toxic even in trace amounts. The essential metals can also have harmful effects when their intakes exceed the recommended quantities significantly. Food with levels of contaminants higher than those specified in the Annex to the Regulation should not be placed on the market. Canned foods offer a shortcut in meal preparation which is most favored by those who are stretched for time.

Methods & Materials: The concentration of mineral and toxic heavy metals has been determined in 60 samples of canned and frozen green pea, for comparison in 2014. These samples (30 of them were canned corn and the rest were frozen) were collected from different local markets of Tehran, Iran. For reliable, accurate and precise measurements, Inductively Coupled Plasma - Atomic Emission Spectrometer (ICP-AES) has been used to quantify the levels of the studied metals in the studied samples after wet digestion in Pharmaceutical Sciences Branch, Islamic Azad University.

Results: The results obtained revealed that, the mean ranges of the elements analyzed in (mg kg⁻¹) between the frozen and canned food are as follows:

Pb (3.64 – 5.78), Zn (20.17 – 31.14), Cu (12.22 – 18.03), Ca (1899 – 9524), Mg (1209 – 1544), Na (8114 – 18300), Sn (55.73- 3285) respectively. Some of the measured values found, not only relatively high in canned compared to frozen food samples, but also exceeds the international tolerance levels.

Conclusion: The monitoring of mineral and heavy metals in frozen and canned food samples is vital important challenge to control and improve the food industry strategies.

Keyword: Green Pea canned, Toxic heavy metal, Contamination, Food Safety, Iran

Abstract No: 45

Heavy Metals and Nutrients Leaching and distribution in sewage sludge – treated soil

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Abstract

Background: Leaching column experiments were conducted to determine the degree of mobility of heavy metals (HMs) and nutrients after the addition of municipal solid sewage sludge (MSS) in a sandy-loam soil. Treatments were (1) soil application of low metal content MSS, (2) soil application of metal-enriched municipal solid sewage sludge (EMSS), and (3) control. The MSS application represented a dose of 200 Mg dry weight (dw) ha⁻¹. Soil columns were incubated at room temperature for 15 d and were irrigated daily with distilled water to make a total of 557mm.

Methods & Materials: Leachates were collected and analyzed for HMs and nutrients. The Ni and Pb added to soil via MSS and EMSS were found to be leached through the 20cm columns of calcareous sandy soil although Ni and Pb concentrations in the percolate were small relative to the total amounts of metals applied. Losses of K⁺ from the EMSS, MSS, and control were 92.5, 82.0, and 52.5 kg ha⁻¹, respectively. Losses of Mg²⁺ were in the range from 104.4 (control treatment) to 295.2 kg ha⁻¹ (EMSS), while the loss of Ca²⁺ was in the range from 265.0 (control treatment) to 568.2 kg ha⁻¹ (EMSS).

Results & Conclusion: The results showed that the amounts of P leached from EMSS (3.02 kg ha⁻¹) and MSS (2.97 kg ha⁻¹) were significantly larger than those from the control treatment (1.54 kg ha⁻¹). The geochemical code Visual MINTEQ was used to calculate saturation indices. Leaching of P in different treatments was controlled by rate-limited dissolution of hydroxyapatite, b-tri-Ca phosphate, and octa-Ca phosphate. The results indicate that application of MSS to a sandy soil, at the loading rate used in this study, may pose a risk in terms of groundwater contamination with Ni, Pb, and the studied nutrients.

Keywords: Leaching- Sewage Sludge- Heavy Metals

Abstract No: 28

Heavy Metal Removal from Commercially-available Fruit Juice Enveloped Products

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Abstract

Background: There has been an increasing trend in the production and consumption of local and imported fruit juices in Iran. The presence of impurities and foreign matter in finished products for human consumption is of great concern because they present health hazards when they exceed beneficial limits. The manufacture of juices requires special attention in terms of purity and the sources of water and its purification are crucial for maintaining quality and safety. Biosorption can be defined as the removal of metal or metalloid species, compounds and particulates from solution by biological material. Large quantities of metals can be accumulated by a variety of processes dependent and independent on metabolism. As citric acid content of beverages may be useful in nutrition therapy for calcium urolithiasis, especially among patients with hypocitraturia. Citrate is a naturally-occurring inhibitor of urinary crystallization; achieving therapeutic urinary citrate concentration is one clinical target in the medical management of calcium urolithiasis. When provided as fluids, beverages containing citric acid add to the total volume of urine, reducing its saturation of calcium and other crystals, and may enhance urinary citrate excretion. Information on the citric acid content of fruit juices and commercially-available formulations is not widely known.

Materials & Method: Levels of trace metals in 125 selected fruit juice commercially available enveloped samples (Orange, Mango, Tropical, Cherry and Grape) purchased from Tehran local Market in 2014. Heavy metals were determined using atomic absorption spectrophotometer (AAS) by wet digestion method in Pharmaceutical Sciences Branch, Islamic Azad University Tehran-Iran.

Result: From the obtained result Cd and Pb were detectable in all the samples especially in Mango and Tropical. The efficiency removal of lead and Cadmium and neutralization of Calculus contain of juice by organic acid (Citric acid) as a chelating were carried out by using of Atomic Absorption Spectrophotometry technique. The result demonstrated the complexation formulating between the Citric acid and heavy metals. The high efficiency of Citric acid played an important role in removal

of lead and cadmium in addition to this removal were increased by increasing the Citric acid. The Enhancing of Citric acid in removal of lead and cadmium caused to create a slightly tart, refreshing flavor and balance sweetness.

Keywords: Heavy metal removal, Citric acid, fruit Juice

Abstract No: 17

Road traffic effects on Lead uptake in Eldar Pine (*Pinus eldarica*)

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Abstract

Background: Measurement of Lead (Pb) uptake in *pinus eldarica* was carried out in 5 stripes parallel with Tehran-Karaj freeway in spring and summer seasons.

Materials & Method: Measurement of Pb in pine needles was conducted by atomic absorption. Amount of pb in tree row close to freeway and in summer time was three fold compare to farthest row. Also spring Pb uptake in pine tree close to freeway was 4 times higher compared with Pb uptake for pines in inner parts of Chitgar Parkland and average Pb uptake in spring samples was 1..5 time of summer samples.

Results: Amount of Pb in summer samples close to freeway were up to 20 p.p.m in semi-faded samples, which was roughly the same as the pb uptake in spring samples. Concentration of Pb in semi-faded summer samples were 2.5 times of Pb uptake in fresh pine samples in summer.

Keywords: Lead (Pb), concentration, traffic, pine, uptake, Chitgar Parkland

Abstract No: 456

Cadmium removal from aqueous environments using Moringa Oleifera ash as biosorbent

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Abstract

Background: Cadmium (Cd) is one of the main types of heavy metals having wide use in today industrial age. This Heavy metal is very toxic even in very low amount that can cause kidney damage, high blood pressure, bone fraction and destruction of red blood cells. Adsorption considered as the most promising treatment technologies for cadmium (Cd) removal from aqueous solutions. The aim of this study was to determine Moringa Oleifera ash efficiency in removal of Cd from aqueous solutions.

Methods & Materials: Adsorption was studied in batch experiments at room temperature and the effects of experimental parameters such as adsorbent dose (0.1 – 10 g/l), contact time (3 -120 min) and initial Cd concentration (1 -300 mg/l) were studied.

Results: The highest removal adsorption was at 0.5 g/l adsorbent, 30 min contact time and initial Cd concentration at 2 mg/l (100% Cd removal).

Conclusion: It was concluded that the Moringa Oleifera ash can be used as a successful and environmental friendly Cd adsorbent from wastewater effluents.

Keywords: Adsorption, Moringa Oleifera ash, Cadmium, removal

Abstract No: 233

Evaluation of toxic heavy metals concentrations in reservoir of Golestan dyke in Iran

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Abstract

Background: Pollutants such as heavy metals are considered harmful substances to human health. Drinking water, fruits and vegetables are the sources of being affected by these contaminants. Because of water shortage, lakes and dykes have been used for irrigation of the plants. These water sources are possible to be polluted by heavy metals via human activities and sewages. Therefore, there have been some concerns on toxic substances exposure in Golestan dyke of Mashhad, Iran, but no evaluation had been performed. The current study was aimed to investigate toxic heavy metals of lead (Pb), aluminum (Al), chromium (Cr), cadmium (Cd), mercury (Hg) and arsenic (As) in Golestan dyke and to compare with the International standards.

Materials & Methods: Sampling was performed at six sites of the dyke (entrance, exit and four different parts in between) every 10 days during May, June and July 2012. A total of 48 water samples were collected. The toxic chemicals concentrations were estimated by an atomic absorption spectrometer (PerkinElmer model 3030, USA) using heated graphite atomization and mercuric hydride system. The toxic heavy metals concentrations were compared with the Food and Agriculture Organization (FAO) standard.

Results: Mean \pm SEM (standard error of mean) concentrations of Pb, Al, Cr, Cd, Hg and As were 2.61 \pm 0.13, 536 \pm 40.54, 2.36 \pm 0.12, 0.50 \pm 0.013, 2.54 \pm 0.079 and 1.20 \pm 0.17, respectively. Only Hg and Al concentrations were above the Food and Agriculture Organization standard. Highly significant differences ($P < 0.0001$) were obtained on Cr concentrations between May-June (0.0428), May-July (0.0001) and June-July (0.0006). Changes in concentrations for Al, Cd and As were significant ($P < 0.05$) during two of the sampling months. The p-values were 0.0011 (May-June) and 0.0001 (May-July) for Al; 0.0021 (May-July) and 0.0021 (June-July) for Cd; 0.0238 (May-July) and 0.0484 (June-July) for As.

Conclusion: Based on our findings, Hg and Al concentrations were above the FAO standard. Due to high Hg and Al contaminations, the studied water source should not be used for agricultural use. This was recommended to the agricultural authorities. Regular evaluation of heavy metals in dyke water is recommended once it is used for irrigation in the region.

Keywords: Heavy metals, human health, irrigation, contamination

Abstract No: 252

Protective effect of vitamin C on anxiety during cadmium neurotoxicity in male rats

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Abstract

Background: Cadmium is an extremely toxic metal commonly found in industrial workplaces, a food contaminant and a major component of cigarette smoke. Cadmium has been linked to neurotoxicity as well as infertility and cancer. A wide variety of biological effects including central nervous system dysfunctions in humans and experimental animals have been reported earlier by cadmium. It has recently been reported that olfactory primary neurons are a route of entry for cadmium into central nervous system and it is known to enhance production of free radicals in brain. On the other hand, oxidative stress is causing anxiety. So the aim of this study is to investigate the effects of cadmium neurotoxicity on anxiety– like behaviors in the absence or presence of vitamin C, which is an antioxidant able to alter the brain oxidative stress status.

Material and Methods: In this study, 63 male wistar rats were used in 9 groups including: control (saline), cadmium (1.4 , 2.2 mg/kg), vitamin C (80 and 120 mg/kg), cadmium 1.4 + vitamin C 80, cadmium 1.4 + Vitamin C 120, cadmium 2.2 + vitamin C 80, cadmium 2.2 + vitamin C 120. The period of intraperitoneal injection (I.P) was once a day for 21 days. Elevated plus maze was used for studying the anxiety related behavior. Data analysis was performed by using one-way ANOVA.

Results: Results showed that I.P injection of cadmium in both doses, decreased the indices of anxiety on elevated plus maze ($p < 0.01$). Vitamin C in both doses has anxiolytic effects ($p < 0.001$). In the groups of different doses of vitamin C + different doses of cadmium, the presence of vitamin C improved the toxic effect of cadmium ($p < 0.01$).

Conclusion: These observations reveal that cadmium neurotoxicity can affect the anxiety like behaviors. Vitamin C as an antioxidant in combination with cadmium has an improving effects on the anxiety like behaviors.

Keywords: Cadmium neurotoxicity, Anxiety, Vitamin C

Abstract No: 420

Ameliorative effects of lithium on Streptozocin-induced diabetic neuropathy by improving ADP/ATP ratio in dorsal root ganglion of rats

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Abstract

Background: One of the most frequent complications of diabetes is diabetic peripheral neuropathy. Hyperglycemia would result in the advancement of this condition over a period of time. The most effective way in preventing diabetic neuropathy is regular control of glucose. In this study; we evaluated the effects of lithium on streptozocin (STZ)-induced diabetic neuropathy.

Methods & Materials: Diabetic neuropathy was created 7 weeks after administration of STZ (45 mg/kg). Lithium was added to drinking water (450 mg/l) for 7 weeks and its plasma level after this period of time was 0.17 ± 0.02 mmol/l. Levels of adenosine triphosphate (ATP) in dorsal root ganglion (DRG) neurons, oxidative stress parameters, open-field activity test and morphological analysis were assessed in this investigation.

Results: Our results showed significant elevation of oxidative stress biomarkers, reduction of ATP, abnormal morphology of DRG neurons and decrease of total distance moved in rats with STZ-induced diabetic neuropathy. The alterations in mentioned parameters were considerably restored by lithium treatment.

Conclusion: These findings provide evidence for protective effects of lithium on STZ-induced diabetic neuropathy.

Keywords: Diabetic peripheral neuropathy, Streptozocin, Lithium, Oxidative stress, Dorsal root ganglion neurons, Motor function

Abstract No: 366

Evaluation of heavy metals(Pb , Cd , Hg , Cu) in fishes marketing in Isfahan city ,central of Iran

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Abstract

Background: Fish, as a protein supplier, is an important source of food for worldpeople. According to importance of heavy metal in aquatic environment,in this study, the lead (Pb), cadmium (Cd) , merquary(Hg) and copper (Cu) levels were determined in eight species of fish commonly consumed in Isfahan city, Iran.

Materials & Methods: The samples were collected from local markets, randomly. After validation of methods, the samples were prepared using acid-digestion and analyzed by atomic absorption spectroscopy (AAS).

Results: The mean Pb, Cd , Hg and Cu contents in analyzed samples were 0.54 ± 0.43 ppm, 0.05 ± 0.13 ppm, 0.055 ± 0.129 and 0.67 ± 0.06 ppm respectively. Also,the percentage of Pb and Cd contamination were %83/34 and 95/84% when compared to the guideline level Iranian standard and FDA . Although, Cu and Hg was existed in all of the samples, its level was lower than permissible of limit. fishes . Taking collectively,although heavy metals contamination were remarkable in some of the samples ; their exposure are not considerable by aquatic consumption in Iranian populations, due to the low fish consumption in Iran (7kg/year).

Keywords: Fish, heavy metals, Lead, Cadmium, Copper, Merquary

Abstract No: 365

Tracing of heavy metal in marketed hen egg in Hamedan

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Abstract

Background: the presence of heavy metal in water and soil caused by industrial activities can treat environment and human health. Stability and aggregation properties of heavy metals in living tissue caused to various diseases. Hen egg is as a susceptible food for this contamination. The present study determined lead and cadmium concentration in marketed hen eggs in Hamedan.

Materials & Method: The hen eggs were collected from the various local super markets in Hamedan, Iran. Humidity percent of samples was measured and then with the ash of samples obtained by electrical furnace in 550 C°. Obtained ash dissolved by 1 ml concentrated nitric acid. Flaming atomic absorption used for determination of lead and cadmium concentrations.

Results: The average of lead and cadmium concentrations in samples was 0.007 ± 0.001 and 0.3 ± 0.08 mg/kg, respectively. The detected contents of lead and cadmium elements were lower than standard limits of WHO in hen egg.

Conclusion: It is concluded that lead and cadmium concentrations in offered hen eggs in Hamedan aren't worrisome.

Keywords: Heavy metal, Industrial activities, Flaming atomic absorption, hen egg

Abstract No: 338

Protective Effects of zinc supplementation on renal toxicity in rats exposed to cadmium

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Abstract

Background: Cadmium (Cd) is a nonessential element with many industrial applications and is one of the most toxic pollutants in the environment. The ultimate goal of occupational health is prevention of health hazards on workplace; hence, is as a hazardous chemical contaminant in the workplace, Cd needs special attention. The object of this study was to determine the effect of ZnCl₂ on Cd-induced nephrotoxicity in rats.

Materials and Methods: Adult male rats were given CdCl₂ at doses of 0, 1, 2, and 3 mg/kg. Another series of rats were pretreated with 4 mg/ kg of ZnCl₂ 30 minutes prior to administration of various doses of CdCl₂. The experiment was repeated for seven consecutive days. Twentyfour hours after administering the latest dose, animals were sacrificed. Blood samples were analyzed for blood urea nitrogen (BUN) and creatinine levels. Kidney tissues were excised for measuring malondialdehyde (MDA) concentration.

Results: In contrast to the animals that received ZnCl₂, CdCl₂ induced a dose-dependent elevation in BUN, creatinine, and MDA in those without ZnCl₂ pretreatment. Zinc chloride had significantly decreased all biochemical parameters and protected kidney cells against Cd-induced toxicity.

Conclusions: The results of this study supported the potential protective effects of ZnCl₂ on rat kidney tissues against CdCl₂ toxicity.

Financial supported by Ahvaz Jundishapur University of Medical Sciences

Keywords: Zinc Chloride, Cadmium Chloride, Malondialdehyde, Kidney, Rat

Abstract No: 14

Phytoremediation study on different concentrations of soil copper to uptake Zinc element in different organs of *Eucalyptus camadulensis*

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Abstract

Background: Phytoremediation is used for decreasing heavy metals and contaminants inside polluted soils and tolerance of plant is vital and crucial for this purpose. In this case to study affects of Copper also evaluation the ability of Eucalyptus plant to uptake zinc inside root and trunk (stem) experiment was carried out on Eucalyptus camadulensis.

Materials & Method: Three different concentration of copper added to soil and variation of Eucalyptus camadulensis potential to uptake zinc were studied. Experiment carried out with 3 replication and statistical analysis used the SPSS software.

Result: Results showed that the most amount of Zinc uptake occurred inside root and trunk in level of 5 mmol of Copper. Purpose of recent research was investigation on uptake and bioaccumulation of Zinc inside root and trunk (stem) to recognize application of this plant species through polluted agricultural areas and industrial sites.

Keywords: soil pollution, Eucalyptus camadulensis, uptake rate, Heavy Metals.

Abstract No: 235

Determination of Lead in Hair by Graphite Furnace Atomic Absorption Spectrometry

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Abstract

Background: Determination of metal in hair has been the subject of continues interest in the biomedical and environmental sciences. Hair can be considered to be an excretory product, the trace element contents of which reflect mineral metabolism in the body. However, their concentrations bear little relation to the levels in other tissues. We have used Graphite furnace Atomic Absorption Spectrometry (Perkin Elmer, Model 3030) for this analysis.

Materials & Methods: Hair samples were pre-washed with nonionic detergent and soaked in deionized water for 10 minute. It was followed by soaking in acetone to remove external contamination and finally the hair samples were washed with deionized water. The samples were dried in an oven at 110 °C for 1 hour and finally kept in a desiccators pending analysis. One gram of hair samples was weighted into quartz vessels; the dried hair samples were digested with 5ml of 4:1 mixture of concentrated nitric acid and perchloric acid, the mixture were heated until complete evaporation to obtain a water clear solution. Digested samples were subsequently diluted with deionized water to 50 ml. Then filtered this solution with filter paper (Whatman 150 mm). A blank digest was carried out in the same way. 25 µl from this solution is injected into the graphite. 10 µl Ammonium mono Vanadat in NaOH was then added to neutralize acidity to prevent graphite tube damage. Thermal Program was selected for drying temp; 130 °c, 400 °c for out of organic solvents and 800 °c for inorganic solvents and ash removal and 1900 °c temp for atomization. Absorbance was measured at 283.3 nm wavelength.

Results: Detection was limits 0.1 µg/l, precision 3.10%, and accuracy was obtained at 98.6 % for this analyses, which were determined by repeated analyses of biological reference material. Pb concentration in Hair of 50 cases of the workers of a car battery factory and 50 cases of healthy subjectwere analysed. The average content of lead in hair of healthy subjects was 2.5 µg g⁻¹, but in workers of the car battery workers was 18.5 µg g⁻¹. The results were matched with the clinical symptoms and blood level of Pb in the workers.

Conclusions: Based on our findings, this method and GFAAS is a reliable method for estimation of hair lead concentrations.

Keywords: Hair, lead poisoning, atomic absorption, graphite furnace atomization

Abstract No: 280

Heavy metals (Mercury, Lead and Cadmium) determination in seventeen species of fish marketed in Khorramabad city, West of Iran

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Abstract

Background: Heavy metals entrance to fish body and transferring to human body systems after their consuming makes numerous undesirable effects and health problems. The aim of this study was determine some heavy metals (lead, cadmium and mercury) in fresh fishes marketed in Khorramabad city, west of Iran.

Materials & Method: In this descriptive study, three samples of 17 fish species with high consumption was taken randomly. Measurement of mercury, lead and cadmium were performed using atomic absorption spectrometry. All measurements were performed three times for each sample.

Result: Lead mean levels in fish samples was in the range 0.736 -1.005 mg kg⁻¹, cadmium range was from 0.015 to 0.196 mg kg⁻¹ and mean content of mercury was 0.431 - 0.107 mg kg⁻¹. Obtained results of this study confirmed that at present mean concentration of lead, mercury and cadmium in supplied fishes muscle is lower than maximum recommended levels according to WHO, EC and FDA guidelines.

Conclusion: Based on the obtained results of this study and the importance of heavy metals in foods and their impacts on human health, continuous monitoring of heavy metals levels in foods is necessary.

Keywords: Fish, Heavy metals, Atomic absorption spectrometry, Khorramabad, Iran

Abstract No: 308

Risk assessment of heavy metals contamination in street dust: A case study of Tehran, Iran

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Abstract

Background:

Materials & Method: A total of 60 street dust samples collected from central area of Tehran were analyzed to determine the concentration of Cd, Cr, Cu, Ni, Pb and Zn by inductively coupled plasma-optical emission spectrometry (ICP-OES). The contamination levels were estimated based on the geo-accumulation index (Igeo), enrichment factor (EF), Pollution index (PI), integrated pollution index (IPI), and potential ecological risk index (RI).

Results: The mean concentration of heavy metals were in the order of Zn > Cu > Pb > Ni > Cr > Cd. The mean Igeo values were 1.53, -1.88, 2.68, -0.67, 1.62 and 2.70 for Cd, Cr, Cu, Ni, Pb and Zn, respectively. Zn and Cu had the highest average EF values among the analyzed heavy metals and fell into “very severe enrichment” class. Potential ecological risk factor (Er) also showed that Cd has a considerable potential ecological risk; therefore, more attention should be paid to Cd contamination.

Conclusion: The Potential ecological risk index values indicated that the street dust samples have a “moderate ecological risk”. The IPI values indicated the street dust samples were ranged from highly to extreme highly polluted.

Keywords: street dust; heavy metal; geo-accumulation index; enrichment factor; potential ecological risk; Tehran

Abstract No: 322

Growth response of *Brassica napus* L. to Zn & Cu nanoparticles

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Abstract

Background: Nowadays, ZnO and CuO nanoparticles have received considerable attention because of their unique physiochemical properties and their applicability in medicine based on their size and shape. Zinc is one of the essential nutrients required for plant growth and copper is important for proper photosynthesis, many enzyme processes, manufacture of lignin (cell walls) and grain production. In the present study, the effect of ZnO and CuO nanoparticles was investigated at physiological levels on *Brassica napus* L (SLM046 cultivar).

Materials & Methods: The seedlings were grown in sub-lethal concentrations of ZnO and CuO NPs (10, 100 and 1000 ppm) in 1/2 Murashige and Skoog medium for 10 days.

Reesult: The results indicate that ZnO and CuO NPs induced the growth promontory response in *Brassica napus* at 10 ppm concentration. However, with increasing concentration of both nanoparticles, the toxic effects emerged. The decrease was observed in root and shoot elongation under high concentration (1000 ppm) of ZnO and CuO. Moreover, fresh and dry weights were decreased significantly compared to controls. In conclusion, application of appropriate concentrations of nanoparticles can improve physiological characteristics of *Brassica napus* plant. However, at higher concentrations, ZnO and CuO had negative effect on the overall growth of the plant. Interestingly, between two nanoparticles, CuO had higher negative impact than ZnO. Nanotechnology has become a dynamically developing industry with a multiplication of applications. However, they represent an important source of nanoparticle contamination of aquatic ecosystems. This work was financially supported by grant application.

Keywords: Nanotechnology, Zinc Oxide, Copper Oxide, *Brassica Napus*, Growth

Abstract No: 553

Arsenic removal from aqueous environments using Date core as biosorbent

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Abstract

Background: Adsorption considered as the most promising treatment technologies for arsenic removal from aqueous solutions. The aim of this study was to determine Date core efficiency in removal of arsenic from aqueous solutions.

Methods & Materials: Adsorption was studied in batch experiments at room temperature and the effects of experimental parameters such as adsorbent dose (0.8 – 6 g/l), contact time (5 -60 min) and initial arsenic concentration (2 -8 mg/l) were studied.

Results: The highest removal adsorption was at 4 g/l adsorbent, 30 min contact time and initial arsenic concentration at 5 mg/l (97% arsenic removal). It was concluded that the Date core can be used as a successful and environmental friendly arsenic adsorbent from wastewater effluents.

Keyword: Arsenic, removal, Date core

Abstract No: 38

Serum Arsenic and Lipid Peroxidation Levels in Patients with Multiple Sclerosis

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Abstract

Background: Oxidative stress plays a crucial role in the pathogenesis of multiple sclerosis (MS). Previous studies have shown that oxidative stress is one of the main underlying mechanisms of arsenic-induced cellular damage. The aim of this study was to assess the serum arsenic level and its relationship with lipid peroxidation in MS patients from Tabriz, as the third most-polluted city of Iran.

Materials & Methods: The study population was consisted of 38 MS patients and 38 matched healthy controls. The serum level of malondialdehyde (MDA), as a lipid peroxidation indicator, and arsenic were measured using thiobarbituric acid reactive substances (TBARS) assay and electro-thermal atomic absorption spectrometry, respectively.

Results: The results showed that the arsenic level in the serum of MS patients (4.92 ± 0.37 $\mu\text{g/L}$) was significantly higher than control group (2.73 ± 0.21 $\mu\text{g/L}$) ($P < 0.01$). The difference of MDA levels in MS patients and control group was also statistically significant ($P < 0.03$). Moreover, the serum arsenic and MDA levels were positively correlated in MS patients. The elevated serum arsenic level might explain the increased oxidative stress level in MS patients. We suggest that high arsenic level in serum might be linked to the MS development and therefore, exposure with this heavy metal should be monitored and limited.

Keywords: Multiple sclerosis, Oxidative stress, Malondialdehyde, Arsenic

Abstract No: 515

The effect TiO₂ heavy metals on three different strain of *Saccharomyces cervicis* in synthesizing of organic nanoparticles

Elham Zolfagharpour

Abstract

Background: Nanoparticles with the size between 1 and 100 is known not only with toxic effect for living organisms but also with some values. Among metal nanoparticles, the organic nanoparticles is known with less toxic effects. So far several various strategies have been introduced to synthesize organic metal nanoparticles. However, foremost among different methods, the chemical method due to their inherent advantage in producing large quantities of nanoparticles, is the best method for production of organic nanoparticles. Also many biological organisms, both unicellular and multicellular are known to produce inorganic materials either intra- or extra cellular. In fact the biosynthesis of nanoparticles employs use of biological agents like bacteria, fungi, actinomycetes, yeast, algae and plants.

Materials & Methods: In order to synthesize organic nanoparticle the toxic effect and proper concentration of TiO₂ heavy metals were studied on three different concentration of *Saccharomyces cervicis* which were isolated from fish intestine. *S. cervicis* was cultured in optimum media and condition at 3 different concentration for heavy metals which were added to culture media. The cell numbers of yeast were measured at first and at the end of experiment after 72 hours.

Results: The results of present study revealed that the optimum concentration for growth of the yeast cells is different with different concentration of heavy metals.

Keywords: Yeast, *S.cervicis*, organic nanoparticles, TiO₂, heavy metals

Nano Toxicology

Abstract No: 112

PFOS imprinted polymers: synthesis, characterization and application

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Abstract

Background: In this study, a novel method is described for the determination of Perfluorooctanesulfonic acid in biological fluids using molecularly imprinted solid-phase extraction (MISPE) as the sample extraction technique combined with high-performance liquid chromatography (HPLC). The water-compatible molecularly imprinted polymers (MIPs) were prepared using 4-Vinylpyridine as functional monomer, ethylene glycol dimethacrylate as cross-linker, acetonitrile as porogen and Perfluorooctanesulfonic acid as template molecule.

Materials & Methods: The novel imprinted polymer was used as a solid-phase extraction (SPE) sorbent for the extraction of methylphenidate from human serum. Various parameters affecting the extraction efficiency of the polymer have been evaluated. The optimal conditions for the MIP cartridges were studied.

Results: The limit of detection (LOD) and limit of quantification (LOQ) for methylphenidate in serum samples were 1.3 and 10 ng mL⁻¹, respectively. The recoveries for serum samples were higher than 92%.

Keyword: Molecularly imprinted polymer (MIP); Perfluorooctanesulfonic acid (PFOS); Pharmaceutical analysis

Abstract No: 5

Sensitive molecular determination of polycyclic aromatic hydrocarbons based on thiolated Calix [4] arene and CdSe quantum dots (QDs)

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3-Urmia Lake Research Institute

Abstract

Background: A novel and sensitive electrochemical sensor based on cone 25, 27-(3-thiopropoxy)-p-tert-butyl Calix [4] arene supramolecular has been developed for quantitative determination of polycyclic aromatic hydrocarbons (PAHs).

Methods & Materials: The method is effective by immobilizing of calix [4] arenes to Fe₃O₄ magnetic nanoparticles. CdSe QDs were applied as electrochemical labels. CdSe quantum dots (QDs) modified PAHs in competition with sample PAHs were intercalated into calix [4] arenes supramolecules via host-guest interaction through individual bowl shaped calix[4]arenes. The stripping analysis of the Cadmium dissolved from CdSe nanoparticles provided a very sensitive method for PAHs detection in samples. The signal decrease of the QDs was proportional to the increase in the concentration of the PAHs. Under optimal conditions, from six PAHs the square wave voltammetry (SWV) response of QDs decreased linearly for anthracene and naphthalene in the range of $2.1 \times 10^{-7} - 1.4 \times 10^{-5}$ and $1.5 \times 10^{-6} - 2.5 \times 10^{-5}$ M. The calculated detection limits (3 δ), were 20.1 ng/mL for anthracene and 105.5 ng/mL for naphthalene.

Keyword: cone 25, 27-(3-thiopropoxy)-p-tert-butyl Calix[4]arene, Polycyclic aromatic hydrocarbons (PAHs), CdSe QDs, Square wave voltammetry (SWV)

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Abstract No: 69

The effect of silver nanoparticles on apoptosis and dark neuron Production in rat hippocampus

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2-Electronic microscope Center, Buali Institute, Mashhad University of Medical Sciences, Mashhad, Iran

Abstract

Background: Silver nanoparticles (Ag-NPs) are used widely in bedding, water purification, tooth paste and toys. These nanoparticles can enter into the body and able to move into the hippocampus. The aim of this study was to investigate neurotoxicity effect of silver nanoparticles on the adult rat hippocampus.

Methods & Materials: 12 male Wistar rats were divided into two groups randomly (n = 6 in each group) as follows: control and Ag-NPs. Animals in the Ag-NPs group received 30 mg/kg Ag-NPs via gavage for 28 consecutive days. At the same time, distilled water was administered for the rats of control group. At the end of treatment, animals were deeply anesthetized, sacrificed and their brains were collected from each group. Finally the brain sections were stained using toluidine blue and TUNEL. Then dark neurons (DNs) and apoptotic neurons were counted by means of morphometric method to compare two groups.

Results: our results showed that the numbers of DNs and apoptotic cells in the CA1, CA2, CA3, and dentate gyrus (DG) of hippocampus significantly increased in the Ag-NPs group in comparison to the control group (P<0.05).

Conclusion: Exposure to Ag-NPs can induce dark neuron and apoptotic cells in the hippocampus.

Keywords: Silver nanoparticles; Neurotoxicity; Hippocampus; Dark neuron; Apoptosis

Abstract No: 536

Study on the removal of mercury from aqueous media using modified magnetic nanoparticles with carbon prepared from agricultural wastes

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Abstract

Background: The entrance of heavy metals from industrial waste waters to natural water sources, has been a serious concern in recent decades. Mercury is one of these toxic heavy metals with particular characteristics. Mercury compounds is used as catalyzer, fungicides, pesticides, disinfectants and detergents and these enters the environment by different human being activities like fossil fuels burning and industrial wastes disposal. Then it is absorbed by aquatics and finally threatens human health and life by entering the food chain. Several technics are used to remove mercury from waste waters before releasing in natural waters. In two recent decades, adsorption processes specially using agricultural wastes have been considered because of their advantages like high quantity available, high adsorption efficiency, low operation cost, high process velocity and no secondary waste generation. Magnetic iron oxide nanoparticles are used as appropriate adsorbent in extraction, separation and removal of organic and inorganic species due to their chemical, electrical and optic specifications and also suitable magnetic characteristics, low toxicity, reasonable price, easy synthesis, fast extraction possibility, nanoparticles surface modification possibility and high efficiency. In this study adsorption of mercury on magnetic iron oxide nanoparticles generated by modified agricultural wastes is used for mercury removal from aqueous media.

Methods & Materials: To study the amount of mercury removal in different conditions, the experiments have been repeated at least three times. In this way the resultant statistical population can be analyzed. The mercury solution concentration has been measured by cold vapor atomic absorption spectroscopy method. Also the effect of different parameters like temperature, contact time, pH, cation primary concentration and adsorbent amount on adsorption is studied using OVAT optimization method.

Results: The results showed that the maximum removal during the period of 2 min at 45 ° C , PH:9 and the absorber 4 gr/l done . It was found that with increasing concentrations of mercury ions removal rate decreases and the optimum concentration was 10 ng/ml. The results are studied based on adsorption models like D-R, Langmuir, Freundlich and the comparison of results are studied using SPSS, t-test and ANOVA. The results of method reliability parameters shows that calibration curve has a good linear regression analysis. The regression equation on 10-100 ng/ml concentration range is $y = 0.0049x + 0.0179$ ($R^2 = 0.9999$).

Conclusion: According to calculations this method has good accuracy and precision.

Keyword: Mercury, adsorption, modified magnetic nanoparticles

Abstract No: 50

Exposure to titanium dioxide nanoparticles during developmental period induces apoptosis in the rat offspring hippocampus

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Abstract

Background: Titanium dioxide nanoparticles (TiO₂-NPs) widely used in the fields like cosmetics, food and drug. Maternal exposure to TiO₂-NPs during developmental, has been demonstrated to hippocampal injury and decrease the learning and memory of the offspring, but very little is known about its injury mechanism. This paper describes the in vivo apoptotic effects of TiO₂-NPs upon rat offspring hippocampus during developmental period.

Materials & methods: Wistar pregnant and lactating rats were received intragastric TiO₂-NPs (100 mg/kg body weight) daily from gestational day (GD) 2 to (GD) 21 and postnatal day (PD) 2 to (PD) 21 respectively. Animals in the control groups received the same volume of distilled water via gavage. After end of treatment, offspring were deeply anesthetized and sacrificed. Then brains of each group were collected and sections of the brains from the rat offspring were stained using TUNEL staining. Moreover the right hippocampus (n=6 per each group) were removed from the right hemisphere for evaluating the expression of Bax and Bcl-2 level.

Results: Results of histopathological examination by TUNEL staining showed that maternal exposure to TiO₂-NPs during both pregnancy and lactation periods increased apoptotic cells significantly ($P<0.01$) in the offspring hippocampus. Moreover compared with the control group, the mRNA levels of Bax and Bcl-2 in the TiO₂-NPs group were significantly increased and decreased, respectively ($P<0.01$).

Conclusion: These findings provide strong evidence that maternal exposure to TiO₂-NPs can induce the offspring hippocampus pathological changes and apoptosis.

Keywords: Titanium dioxide nanoparticles, Developmental exposure, Hippocampus, Apoptosis, Neurotoxicity

Abstract No: 91

Evaluation of Histopathologic Effects of Orally Administered Iron Oxide and Nano Iron Oxide in the Rat

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Abstract

Background: During recent years, nanotechnology has caused a sudden progress in various industries. Nano particles of iron oxide with their unique properties are used in medical sciences in the treatment of anemia, radiography, diagnosis of some diseases, and treatment of cancers as well gene therapy. The aim of the present project was to study the histopathological effects of nano iron oxide in comparison to ordinary iron oxide as well as iron sulfate after oral exposure in the rat.

Methods & Materials: In the stomachs of the iron sulfate group, there was an increase of 53% in the number of main cells and 100% in the number of undifferentiated cells ($P<0.05$). The length of the gastric glands was increased by 60% and 46% in the iron sulfate and iron oxide groups, respectively ($P<0.05$); nano iron oxide had no effect. No significant change in the duodenum of the control and treated groups was observed. Interestingly, necrotic cells were decreased by 85%, 71% and 78% in the groups treated by iron sulfate, iron oxide and nano iron oxide, respectively ($P<0.05$); diameter of the hepatocytes remained unchanged. In the spleen, there was a 93% increase in the number of hemosiderin-containing cells only in iron oxide treated group ($P<0.05$).

Results & Conclusion: Increased number of main and undifferentiated cells in the stomach by iron sulfate is likely a sign of beneficial effect on the proliferation and differentiation of the cells and, thereafter, an enhanced secretion activity in the stomach. Decreased number of the necrotized cells by all three iron compounds showed that this element, irrespective of the compound type, may play a positive role in the liver tissue health. Of the compounds used, iron oxide is likely to cause hemosiderosis while detrimental effects of the nano compounds is required further investigation.

Keyword: iron oxide, nano iron oxide, histopathologic effect

This study has been supported financially by Iranian nanotechnology initiative council as well as Tehran university faculty of veterinary medicine.

Abstract No: 92

Evaluation of Blood Levels of Iron after Oral Administration of Iron Oxide and Nano Particles of Iron Oxide in Rabbits

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Abstract

Background: Considering to the important role of Iron in normal physiology of the living organisms also the importance of nanotechnology during recent years This study aimed to evaluate the effect of oral nano iron oxide on serum iron status in comparison to that of conventional iron oxide, and iron sulfate as a reference salt.

Methods & Materials: 20 adult rabbits were randomly divided into 4 groups of 5 each. In all animals, blood samples were taken before and one hour later oral administration of iron sulfate, conventional iron oxide or nano iron oxide at a dosage of 10 and 30 mg/kg with 1 week distance. Serum iron and TIBC (Total Iron Binding Capacity) were measured.

Results: The order of the efficacy of iron compound was as follows: iron sulfate > conventional iron oxide = nano iron oxide. In respect to TIBC alterations, in low dose of iron sulfate group it was elevated, in conventional iron oxide group it was not changed but in all other control and treated groups it was decreased.

Conclusion: From the finding of this project it was concluded that there was no considerable difference between conventional iron oxide and nano iron oxide on iron parameters in the rabbit.

Keyword: Iron oxide, Blood level, Nanotechnology

This study have been supported financially by Iranian Nanotechnology Initiative Council as well as Tehran University, Faculty of veterinary Medicine.

Abstract No: 96

A Comparative Study on the Interference of Conventional versus Nano-particles of Iron Oxide with the Bioavailability of Oral Oxytetracycline in Rabbit

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Abstract

Background: It has been shown that nano-sized compounds have different characteristics and behave differently from chemicals with larger particle size. Based on this background, the present study carried out to examine the interference of iron salts with oral absorption of tetracyclines using conventional and nano-sized iron salts.

Methods & Materials: Twenty rabbits were randomly divided into 5 groups, 4 rabbits in each, and were examined as below: one group received oxytetracycline intravenously while the remaining groups were given oxytetracycline orally along with normal saline (control group), iron sulfate, iron oxide and nano-sized iron oxide. Blood samples were taken from the rabbits in predetermined time points and the serum of each sample was separated and underwent liquid-liquid extraction. The concentration of oxytetracycline in each serum sample was determined using a high performance liquid chromatography (HPLC). The chromatographic conditions were as mobile phase consisting oxalic acid buffer (80%)-acetonitrile (20%) running through a C18 column at the flow rate of 1ml/min with UV detection at 355nm. Based on serum concentrations, pharmacokinetic calculations for determination of area under the plasma concentration-time curve (AUC) for oxytetracycline in each experimental group were done.

Results: The results showed that the mean and standard deviation (SD) of AUC values for oxytetracycline in 0-12 h post dosing were 37.86 ± 4.24 in intravenous group and 14.30 ± 3.18 $\mu\text{g/ml/h}$ in control group. The mean of AUC values in iron sulfate, iron oxide and nano-sized iron oxide were 4.78, 4.55 and 4.52 $\mu\text{g/ml/h}$, respectively. the mean of the highest concentrations obtained (C_{max}) in intravenous, control, iron sulfate, iron oxide and nano-sized iron oxide groups were 83.48, 2.76, 0.8, 0.64 and 0.76 $\mu\text{g/ml}$, respectively. The bioavailability of oral oxytetracycline in control group was 37.78 ± 8.4 . Additionally, the extent of oral oxytetracycline absorption in nano-sized group was low and similar to all other groups receiving iron salts.

Conclusion: In summary, these findings imply that iron oxide, even in nano- size form, interferes with the absorption of tetracyclines and differences in particle size do not change this property significantly.

Keyword: Oxytetracycline, Interaction, Nano, Iron

This study have been supported financially by Iranian Nanotechnology Initiative Council as well as Tehran University, Faculty of Veterinary Medicine. Of Veterinary Medicine.

Abstract No: 554

Influence of gold nanorods surface modifications on the cellular toxicity in breast cancer cells

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Abstract

Background: Gold nanorods (GNRs) are widely used in the biomedical applications such as photothermal therapy, drug delivery and imaging purposes. Nonetheless, there are few studies on the hazardous impacts of GNRs and their biological indicators. It is noteworthy to mention that toxicity of GNRs is significantly influenced by their surface modification agents. In this work we evaluate influence of thiol-based surface modifications on the primary cellular toxicity of GNRs.

Methods & Materials: The GNRs (16.3×40.7 nm) with the aspect ratio of 2.5 were synthesized using wet-chemical method and characterized using transmission electron microscopy (TEM) and zeta potential measurements. The uptake of GNRs with different thiol-linked ligands by the breast cancer cells (SKBR3) was studied using inductivity coupled plasma atomic emission spectrometry (ICP-AES).

Results: It was observed that co-modified GNRs with 50% MUA-50% PEG effectively are taken up by cancer cells in comparison to the control cell.

Conclusion: Our results suggest that the toxic effect of the GNRs is governed by the identity and concentration of the immobilized ligands. The hybrid conjugates induce apoptosis to cancer cells without any significant cellular damage in normal cells.

Keyword: Gold nanorods, cellular damage, toxic effect

Abstract No: 183

Protective effects of yttrium oxide nanoparticles on reduction oxidative stress in sub-acute organophosphate exposure in rat pancreas

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Abstract

Background: Diazinon is kind of organophosphorus insecticide that is a broad-spectrum pesticide effective against different species of insects and pests. Nowadays, there are many studies about toxic effects of organophosphorus compounds. The aim of this study was to evaluate protective effects Yttrium oxide nanoparticles in reduction oxidative stress level, when sub-acute exposure to diazinon occurs.

Materials & Methods: Diazinon at a dose of 75 mg/kg/day was given through gavage to rats once a day and

Yttrium oxide nanoparticles (45 mg/kg per day) were administered by intraperitoneal injection once a day for 2 week. Animals weight and blood glucose were measured during the treatment and oxidative stress biomarkers were investigated at the end of the treatment in plasma pancreas.

Results: Diazinon group represents significant reduction in body weight ($P < 0.001$), Acetylcholinesterase level ($P < 0.001$) and total antioxidant capacity ($P < 0.001$) in compared to control group. Also, diazinon group has increasing effects in lipid peroxidation level, total thiol molecules and blood glucose. Furthermore, data show that, groups which receive yttrium oxide nanoparticles in addition to diazinon, compensates these effects and improve oxidative stress.

Conclusion: As a whole, our findings demonstrate a significant improvement in biomarkers of diabetes including oxidative stress by using yttrium oxide nanoparticles. So this nanoparticle can be used not only safely, but also as a drug for treating diseases which associated with oxidative stress.

Keyword: Organophosphorus; diazinone; oxidative stress; yttrium oxide nanoparticles

Abstract No: 159

An electrochemical strategy for simultaneous determination of fenitrothion and bifenox using glassy carbon electrode modified with multiwalled carbon nanotube/gold nanoparticles

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Abstract

Background: Electrochemical behavior of fenitrothion (FT) and bifenox (BF) was investigated using cyclic voltammetry and differential pulse voltammetry on the glassy carbon electrode.

Methods & Materials Cathodic peaks for the reduction of Ar-NO₂ group in both fenitrothine (FT) and bifenox (BF) overlap strongly which makes difficult determination of these compounds individually from their mixtures by this cathodic peak. By an electrochemical irreversible reduction of Ar-NO₂ in FT and BF it was transformed into a reversible redox couple (Ar-NHOH/Ar-NO) which can be used to simultaneous determination of fenitrothion (FT) and bifenox (BF) by square wave voltammetry. The experimental parameters, such as pH value, prepotential magnitude, prepotential exertion time and pulse amplitude of SWs were optimized. To obtain better detection limit and sensitivity, the surface of the glassy carbon electrode was modified with multi-walled carbon nanotube/gold nanoparticles. Scanning electron microscopy (SEM) and differential pulse voltammetry (DPV) were used to characterize the performance and structure of modified electrode.

Results & Conclusion: Under the optimized experimental conditions FT and BF give linear response over the range of 0.2–60.0 µM. The detection limit for both FT and BF was found to be 0.09 µM. The practical application of the modified electrode was demonstrated by measuring the concentration of FT and BF in river water and apple samples.

Keyword: Fenitrothine, Bifenox, Multiwalled carbon nanotube, Gold nanoparticles, Modified electrode, Simultaneous determination.

Abstract No: 157

In vivo toxicological investigation of ibuprofen loaded on polyvinylpyrrolidone/KIT-5 nanocomposite as a novel drug delivery system

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Abstract

Background: Mesoporous silica nanoparticles (MSNs) are emerging as one of the new and promising nanomaterials for biomedical applications, but the biocompatibility AND Toxicity of MSNs in vivo has received little attention.

Methods & Materials: In the present study we compared the hepatotoxicity and nephrotoxicity of three treatment group Ibuprofen, KIT-5/PVP, KIT-5/PVP-Ibuprofen. AS Regards, ibuprofen Occupy 37% of KIT-5/PVP, Determined THE Doses, AND Compared Their Toxicity. Ibuprofen (275, 550, 1100mg/kg), KIT-5/PVP (486, 936, 1872mg/kg), KIT-5/PVP-Ibuprofen (743, 1486, 2972mg/kg) AND 1CC 1%CMC Solution AS Control, Administered BY Gavage IN Rats FOR 5Days. Overall, The Results Showed That IN Three Groups Showed Hepatotoxicity and Nephrotoxicity, AND Hepatotoxicity and Nephrotoxicity Enhanced WITH Addition Doses. THE Mean Hepatotoxicity and Nephrotoxicity OF KIT-5/PVP Was More Than Ibuprofen. THE KIT-5/PVP-Ibuprofen, Showed Significant Hepatotoxicity and Nephrotoxicity Compared WITH KIT-5/PVP AND Ibuprofen Alone. KIT-5/PVP-Ibuprofen Which Induced Significant Hepatic AND Nephrotic Oxidative Stress. In Addition oxidative stress plays an important role in the positive synergistic toxicity of KIT-5/PVP and Ibuprofen.

Results & Conclusion: Since ibuprofen is a drug model for studying toxicity of KIT-5/PVP in our study AND our results showed that the KIT-5/PVP, KIT-5/PVP-Ibuprofen does not have significant toxicity at low dose, this carrier can be used as carriers for drugs that require lower doses when given, are to be used

Keyword: Mesoporous silica nanoparticles (MSNs), Ibuprofen, KIT-5, oxidative stress

Abstract No: 154

Effect of magnesium oxide nanoparticles on chlorpyrifos-induced apoptosis in human

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Abstract

Background: Chlorpyrifos (CP) is a member of the most commonly used organophosphorus insecticide. It is a well-known that CP results in embryo toxicity, Geno toxicity, hepatic dysfunction, neurotoxicity, and immunological abnormalities. In the present study, it is proposed to investigate the possible modulatory role of magnesium oxide nanoparticles (MgO NPs) against CP-induced apoptosis in human lymphocytes.

Methods & Materials: Isolated lymphocytes were exposed to 12 µg/ml CP either alone or in combination with different concentrations of MgO NPs (0.1, 1, 10 and 100 µg/ml). After 3-day incubation, the cell death modes (apoptosis vs. necrosis) were measured with flow cytometer.

Results: Our results indicated that CP-exposed lymphocytes treated with MgO NPs resulted in a significant reduction in the rate of mortality in a dose-depend manner.

Conclusion: In conclusion, our results demonstrate that MgO NPs meaningfully were capable to prevent CP-treated human lymphocytes from apoptosis and necrosis, which is demonstrating the operative potential of MgO NPs in future immune deficiency therapeutic strategies.

Keyword: Human lymphocytes, Chlorpyrifos, Magnesium oxide nanoparticle, apoptosis.

Abstract No: 241

Effect of topical Nanoliposomes of Paromomycin on Rats Liver and Kidney

Shahin Ahmadi, Heibatullah Kalantari

Abstract

Background: Hepatotoxicity due to drugs is the most common cause of deaths. Nephrotoxicity of the drugs is usually associated with the drugs accumulation in renal tissue. Paromomycin sulfate (PMS) is an anti-leishmania drug. Although the topical approach for the treatment of leishmania is attractive, its use might cause nephrotoxicity and hepatotoxicity. This study aimed to evaluate probable nephrotoxicity and hepatotoxicity of topically administered PMS liposomes.

Methods: Nine groups of male rats were used in this study; each group consisted of 6 rats that were evaluated in 3 time periods of 10, 20, and 30 days. Three groups were placed in each time period; a control group did not receive any medicine; a negative control group received liposome without paromomycin sulfate; and a positive control group received nanoliposomal formulations containing paromomycin sulfate. Pharmaceutical formulation (topical form) was used 2 times a day in a 12-hour interval. At the end of the period, hepatic enzymes (ALT, AST, and ALK), BUN levels, and serum creatinine were measured.

Results: The results showed that no significant change was occurred in the amount of the above factors compared with the control group with the negative control group in 3 time periods ($P > 0.05$). The histopathological results of the liver and kidney showed that there was no difference in the between the negative control and positive control groups and the control group in the 10- and 20-day periods, and they had a normal structure. However, after the 30-day time period a reversible cellular inflammation in the liver and mild kidney necrosis was seen in the positive control group versus the control and negative control groups.

Conclusions: In general, it can be said that the application of nanoliposomal paromomycin sulfate formulations for topical treatment of the cutaneous leishmaniasis does not create serious side effects in the short term, but its long-term use leads to mild renal and liver side effects that requires more attention

Keyword: Paromomycin Sulfate; Liposome; Liver; Kidney; Toxicity

Abstract No: 513

Effect of CuO organic Nanoparticles on survival and growth of two different Artemia species as Artemia urmiana and Artemia franciscana

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Abstract

Background: Nowadays Nanoparticles have found very important role in human's life. This particle smaller than 100 nanometer in size is known with toxic effect from one side which cause mortality and genetic changes in cells and also can stimulate the growth and survival of living creature if is used in proper condition. According to the research providing that the nanoparticle is been converted to organic nanoparticles not only toxic effect of these materials can be controlled but also it is possible to introduce new application for them. The effect of these materializes can be checked on biological models. Artemia as food for farmed fish in aquaculture plays an important role in the modern world as well as being important in biological research. Such models can be used to study the biological effects of nanoparticles on living organisms. Since Artemia is used as live food for the other animals in food chain it is possible to accumulate the nanoparticles in Artemia in order to send to the intestine of bigger creatures after checking toxic effects on Artemia.

Methods & Materials: In present study at firstly CuO nanoparticles was enriched in Saccharomyces cervices which used as food for rearing of Artemia urmiana and Artemia franciscana by the Couattue formula, 1992.

Results: Subsequently growth and survival of the Artemia were checked during 15 days of experiment comparing to the control groups. For this several samples was taken in days 7, 11 and 15 days by measuring growth and survival.

Conclusion: According to the results CuO organic Nanoparticles could stimulated growth and survival of Artemia providing to be selected in proper dosage. More over this particles had different effect on A.urmiana and A. franciscana species.

Keyword: Artemia, TiO₂, Nanoparticles, Growth, Survival.

Abstract No: 521

Combination of supercritical fluid extraction with magnetite nanoparticles for extraction of organophosphorus pesticides from soil samples

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Abstract

Background: Recently, great interest was aroused in the use of magnetic nanoparticles (MNPs) in solid-phase extraction (SPE). These materials exhibit high selectivity, and high recovery of analytes, even from samples with large-volumes. MNPs allow easy and rapid isolation of analytes using an external magnetic field. The presented study, is an application of thiophen/polypyrrole composite-coated magnetic Fe₃O₄ nanoparticles (NPs) for extraction and preconcentration of organophosphorus pesticides from soil samples.

Methods & Materials: In this work Supercritical fluid extraction (SFE) coupled with magnetite nanoparticles and followed by gas chromatography-flame ionization detection (GC-FID) was applied for extraction and determination of ultra-trace amounts of seven organophosphorus pesticides (OPPs) (diazinon and Malathion) in soil. Supercritical CO₂ at 150 bar, 60 °C, 10 min static and 30 min dynamic extraction times was used to extract the pesticides. For MNPS the effective parameters influencing the extraction efficiency including pH of sample solution, amount of adsorbent, time of adsorption and desorption, salt effect, type and volume of suitable solvent for desorption of the analytes were studied and optimized.

Result: Under the optimum conditions, pre-concentration factors in a range of 208–895 were obtained. The performance of the proposed method was studied in terms of linear dynamic ranges (LDRs from 0.02 to 100 ngmL⁻¹), linearity ($R^2 \geq 0.995$), precision ($RSD \% \leq 8.1$) and limits of detection (LODs in the range of 0.006–0.2 ngmL⁻¹). In addition to preconcentration, MNPS also served as a technique for sample clean-up.

Keyword: magnetic nanoparticle-composit thiophen/pyrrol-GC-FID

Abstract No: 530

Toxicity evaluation of extract of banana peel at nano scale in two spot Gourami fish

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Abstract

Background: Natural extracts of fruit and peels obtained from the plant *Musa sp* (musaceae) consist of various chemical compounds such as Melatonin, Serotonin, Catecholamine which can be effective for treatment of diseases such as depression, and Parkinson syndrome. In present study the acute toxicity of extract of banana peel as nano scale which might potentially cross the blood brain barrier and in this regard being more effective for clinical use is evaluated using a bioassay technique.

Methods & Materials: Nano extracts of banana peels (NEBP) which were prepared by the previous studies and also confirmed by Scanning Electron Microscopy (SEM), were studied in this study in order to be determined its general toxicological profile. Different concentrations of NEBP which ranged from 2 to 20 ng/ μ l were applied to gourami fish fry two spotted (*Trichogaster trichopterus*) for one week assay. LC50 values for each assay were obtained by probit analysis after taking average for three distinct experiments.

Results: The mean LC50 value obtained from lethality of gourami fish fry to NEBP was as 102.84 \pm 15.65 ng/ μ l.

Conclusion: The bioassay results showed that the extract of banana peels has dose dependent toxicity to gourami fish and can be considered as significantly active.

Keyword: gourami fish, banana peels, Serotonin

Abstract No: 487

Study of effect of mesoporous silica nanoparticles on isolated mitochondria

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2-Faculty Member of Standard Research Institute- Iranian National Standards Organization

Abstract

Background: For a novel therapeutic strategy, the use of nanoparticles as a drug-delivery system can provide a possible opportunity, which can deliver drug molecules to the targeting site through the nanoparticle formulation; therefore, an enhancement of therapeutic efficiency by selectively increased local drug concentration in the tumor tissues can be easily achieved. Several different nanodevices have been suggested to provide a benefit to the drug delivery scene. Delivery systems have been applied to prolong the circulation time and bioavailability of certain drug molecules but addressing the drug-delivery vehicles to specific tissues or cells still lies in the future. Mesoporous silica nanoparticles have several advantages as drug-delivery vehicles, the size and shape of the particles are easily tunable. The high pore volume and surface area allow for a high drug load. The carrier in drug-delivery system must be inert on cell and organelles. In this study the effect of MSNs on mitochondria was investigate. Mitochondria as the most important organelles in appaptosis pathway.

Methods & Materials: Mitochondria was prepared from Sprague-Dawley rat's liver using differential centrifugation then viability measure by MTT assay. This assay is a quantitative colorimetric method to determine cell viability. It utilizes the yellow tetrazolium salt (MTT) which is metabolized by mitochondrial dehydrogenase enzyme from viable cells to yield a purple formazan reaction product which was determined spectrophotometrically at wavelength of 570nm. Isolated mitochondria incubated with different concentration of MSNs (0-400µg/ml) for one hour. Then the supernatant removed and added MTT for two hours.

Results: Different concentration of MSNs (0, 50, 100, 200, and 400) did not show significant effect on isolated mitochondria.

Conclusion: In this range of concentration MSNs was inert. Therefore the MSNs are suitable for drug-delivery system.

Keywords: mitochondria viability; Drug delivery; mesoporous silica nanoparticle;

Abstract No: 500

Lethal concentration (LC50 96 h) of copper nanoparticle on Siberian sturgeon (Acipenser baeri) juveniles

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2-International Sturgeon Research Institute, Rasht, Iran

3-Fisheries Department, Faculty of Natural Resources, University of Guilan, Sowmeh Sara, Iran

Abstract

Background: Effects of different concentrations of copper nanoparticle on Siberian sturgeon (Acipenser baeri) juveniles (mean weight 12.3±2.5g) were studied to determine 50% lethal concentration (LC50) within 96 hours.

Methods & Materials: Before starting the experiment, rang-finding tests in different concentrations were performed because they enabled us to choose the appropriate concentration range for the definitive test. Geometric series of colloidal copper nanoparticle concentrations were chosen for toxicity testing in three replicates. Then, the experiments were continued with 6 treatments and 3 repelicates for each. After 7 days of acclimation to the experimental condition, five healthy juvenile were randomly selected from the stocks and transferred to each aquarium and water aerated to maintain the dissolved oxygen concentration close to saturation. Fish were exposed to different concentrations of copper nanoparticle including 0, 0.75, 1.5, 2.25, 3 and 3.75 ppm. During the experiment, reaction and behaviour of fish exposed to copper nanoparticle were monitored. Mortality was recorded in 24, 48, 72 and 96 hours. The LC10, LC50, and LC90 values (with 95% confidence limits) were calculated using the EPA Probit Analysis Program (version 1.5).

Results: The LC10, LC50, and LC90 values of copper nanoparticle in 96 hours were 1.02, 2.08 and 4.21 mg/l. Maximum allowable concentration value of copper nanoparticle was determined 0.421 mg/l for Acipenser baeri.

Conclusion: According to ecotoxicity categories of materials for aquatic organisms copper nanoparticle is moderately toxic for Acipenser baeri.

Keyword: copper, nanoparticle, mortality, LC10, LC50, LC90

Abstract No: 510

Influence of Surface Characteristics of Silica Nanoparticles on mitochondria Toxicity

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Abstract

Background: Mesoporous silica nanoparticles (MSN) are widely used in nanomedicine applications such as drug delivery, cell imaging, and gene transfection. The capability to control the surface characteristics of MSN further provides new opportunities for their applications in medical nanotechnology. Despite the widespread use of MSN, relatively few studies have been undertaken to determine the mitochondrial toxicity effects of MSN exposure.

Methods & Materials: In this present study, the toxicity of MSN of systematically varied surface characteristics was studied on isolated mitochondria obtained from indirectly vital visceral tissues (i.e. liver).

Results: Results suggest that mitochondria toxicity of MSN was mainly influenced by nanoparticles surface characteristics. MSN caused a significant increase oxidative stress in mitochondria as compared to control group and induced a significant damage in mitochondrial outer membrane. MMP collapse, mitochondrial swelling and cytochrome c release were observed following the MSN treatment in isolated mitochondria. Mitochondria toxicity of MSN reduced after Surface modification.

Conclusion: This study sheds light on the rational design of MSN to mitochondrial toxicity and provides a critical guideline in selecting MSN as the appropriate system for medical nanotechnology applications.

Keyword: Mesoporous Silica Nanospheres, mitochondrial toxicity, isolated mitochondria; mitochondrial dysfunction

Abstract No: 512

Effect of Tio2 Nanoparticles on growth rate of three different strains of *Saccharomyces cervices*

Arezou Zareei

Abstract

Background: Nanoparticles are particles between 1 and 100 nanometers in size. Nowadays Nanoparticle research is an area of intense scientific interest due to a wide variety of potential applications in biomedical fields. In general, nanoparticles are considered a discovery of modern science. This particles is known also with toxic effect which cause mortality and genetic changes in cells and also can stimulate the growth and survival of living creature if is used in proper condition. Unicellular organism such as yeast cells has worldwide application in toxic effect test of materials. Unicellular yeast also can convert toxic Nanoparticles to organic Nanoparticles which has less toxic effect with high value and special effect on living organisms. Since unicellular yeasts can be used as live food in wide variety of aquatic animals it is possible to convert nanoparticles to organic nanoparticles with valuable effect in present study at first toxic effect of these two nanoparticles was studied on three different concentration of *Saccharomyces cervices* which subsequently were isolated from fish intestine.

Materials & Methods: The cells of *Saccharomyces cervices* was cultured in optimum media and condition at 4 different concentration for nanoparticles which were added to culture media after sonication. The cell number of yeast was measured at first and at the end of experiment after 72 hours.

Results: The results indicate that in some concentration of nanoparticles the growth rate of yeast can be stimulated. This effect was found different in strains of yeasts.

Keywords: Yeast, *Saccharomyces cervices*, Nanoparticles, Tio2.

Abstract No: 520

Effect of Tio2 Nanoparticles on growth rate of three different strains of *Saccharomyces cervices*

Arezou Zareie

Abstract:

Background: Nanoparticles are particles between 1 and 100 nanometers in size. Nowadays Nanoparticle research is an area of intense scientific interest due to a wide variety of potential applications in biomedical fields. In general, nanoparticles are considered a discovery of modern science. This particles is known also with toxic effect which cause mortality and genetic changes in cells and also can stimulate the growth and survival of living creature if is used in proper condition. Unicellular organism such as yeast cells has worldwide application in toxic effect test of materials. Unicellular yeast also can convert toxic Nanoparticles to organic Nanoparticles which has less toxic effect with high value and special effect on living organisms. Since unicellular yeasts can be used as live food in wide variety of aquatic animals it is possible to convert nanoparticles to organic nanoparticles with valuable effect in present study at first toxic effect of these two nanoparticles was studied on three different concentration of *Saccharomyces cervices* which subsequently were isolated from fish intestine.

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Results: The results indicate that in some concentration of nanoparticles the growth rate of yeast can be stimulated. This effect was found different in strains of yeasts.

Keyword: Yeast, *Saccharomyces cervices*, Nanoparticles, Tio2

Abstract No: 257

Influence of functionality, Porosity, and Surface Characteristics of Silica Nanoparticles on mitochondria Toxicity

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2-Department of medical nanotechnology, Faculty of Advanced Technologies in Medicine, Iran University of Medical Sciences, Tehran, Iran

Abstract

Background: Mesoporous silica nanoparticles (MSN) are widely used in nanomedicine applications such as drug delivery, gene transfection, and cell imaging. The capability to control the surface characteristics, functionality and porosity of MSN further provides new opportunities for their applications in medical nanotechnology. Despite the widespread use of MSN, relatively few studies have been undertaken to determine the mitochondrial toxicity effects of MSN exposure.

Materials & Methods: The present study was carried out to further characterize and compare toxic effect of MSN, surfactant extracted MSN and MSN functionalized with NH₂ on isolated mitochondria obtained from an indirectly vital visceral tissues (i.e. liver& kidney). Mouse mitochondria were obtained by differential ultracentrifugation and incubated with optimal concentrate (0.01 μmol/ml) of nanoparticles substation. The reactive oxygen species (ROS), oxidative phosphorylation, lipid peroxidation, mitochondrial membrane potential collapse (MMP) before mitochondrial swelling ensued in isolated liver and kidney mitochondria were evaluated.

Results: IC₅₀ of MSN (0.01 μmol/ml) in the isolated mitochondria caused a significant increase oxidative stress in Mouce kidney and liver. Showed a marked elevation in mitochondrial membrane potential (MMP) collapse as compared to control group. Incubation of isolated kidney and liver mitochondria with MSN (0.01 μmol/ml) manifested that MSN can leads to induction of reactive oxygen species (ROS) formation, lipid peroxidation, and glutathione oxidation and oxidative phosphorylation were also demonstrated through decreased ATP concentrate in MSN-treated mitochondria. In addition, MSN induced a significant damage in mitochondrial outer membrane. Moreover, MMP collapse, mitochondrial swelling and cytochrome c release were observed following the MSN treatment in isolated mitochondria.

Conclusion: This study sheds light on the functionality of MSN minimize mitochondrial toxicity and provides a critical guideline in selecting MSN as the appropriate system for medical nanotechnology applications.

Keywords: Glucosamine, Mesoporous Silica Nanospheres, mitochondrial toxicity, isolated mitochondria; mitochondrial dysfunction

Abstract No: 328

Development and in vitro and in silico studies of a Apta-Nano-sensor to detect acetamiprid

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2-Biotechnology Research Center, School of pharmacy , Mashhad University of Medical Sciences,

3- Department of Biology, Faculty of Sciences, Urmia University, Urmia, Iran,

Abstract

Background: Pesticide detection is main concern for food safety experts. Therefore, designing an accurate, rapid and cheap sensor for pesticide residues is important. Biosensors, detecting pesticide residues could be replaced for current methods such as HPLC or GC-MC.

This research describes preparation of a biosensor based on aptamer (Oligonucleotide ss-DNA) as receptor, silver nanoparticle (AgNPs) as optical sensor and salt (NaCl) as aggregation inducer of AgNPs to detect the presence of acetamiprid.

Materials & Methods: After optimization, the 0.6 μ M aptamer and 100 mM salt were employed. The selectivity and sensitivity of complex were examined against different pesticides and different acetamiprid concentrations respectively. To simulate in vitro experimental conditions, bioinformatics soft wares including MOE and Namd were used for docking predicting in vivo conditions respectively.

Results: The results showed detection of acetamiprid at 0.02 ppm (89.8×10^{-9} M) level in addition to selectivity. Software outputs introduced two loops as active sites in aptamer and confirmed aptamer- acetamiprid bonding.

Keywords: Acetamiprid, Aptamer, AgNPs, Pesticide residues, Simulation, In Silico

Abstract No: 246

Improving function of rat pancreatic islets by MgO nanoparticles; hopes for pancreatitis therapeutics

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Abstract

Background: Nowadays, magnesium oxide nanoparticles (MgO NPs) are widely used in many fields. However, the toxicity and safety of these nanoparticles by in vitro and in vivo studies remain fairly undiscovered. This study was designed to examine the effect of various concentrations of MgO NPs and also exposure time on viability and function of isolated islets of rat's pancreas.

Materials & Methods: Rats' pancreatic islets were isolated and incubated in RPMI 1640 for 24h. Then obtained hale islets were divided into eight groups, which were supposed to be exposure to 3 different MgO NPs dosage within two different times. At the end, three main factors were measured including viability by MTT assay, reactive oxygen species (ROS) generation by ELISA fluorometer and total antioxidant potential (TAP) by measuring the ferric reducing antioxidant power (FRAP).

Results: The results illustrated considerable changes: viability of cells which were treated by the concentration of 100 µg/ml showed a dramatic increase while ROS result had a great decrease in this concentration. Also, after 24 h and 48 h, 100 µg/ml MgO NPs increased TAP level dramatically compare to control group and other concentrations ($P < 0.001$).

Conclusion: All together, data show that MgO NPs have positive effects in reduction oxidative stress in pancreatic islets. So, it can be used for improving viability and functionality of islets in islet transplantation procedures.

Keyword: Magnesium oxide nanoparticles; isolated rat pancreatic islets; Oxidative stress; Toxicology

Abstract No: 412

9- Nitrocamptothecin encapsulated in PLGA-PEG 5% induces apoptosis through extrinsic pathway in human ovarian carcinoma cell line A2780

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Abstract

Background: Previous researches have shown that the encapsulation of new anticancer drug, 9-nitrocamptothecin (9-NC) in PLGA nanoparticles could increase its stability and release profile and has more in vitro cytotoxic effect on different cancerous cell lines. In this study we have investigated the mode of cell death induced by 9-NC encapsulated in different formulation of PLGA-PEG nanoparticles in A2780 human ovary carcinoma cell line.

Materials & Methods: Nanoparticles were prepared by the nanoprecipitation method and physicochemical characteristics were evaluated according to standard methods. Cytotoxicity effect was evaluated on A2780 cell line after 24 of exposure to different concentrations of 9-NC and loaded in nanoparticles. Apoptosis was analyzed by assessment the caspases activation. Quantitative real time RT-PCR was used to evaluate the mRNA expression of anti-apoptotic and pro-apoptotic genes expression. Mitochondrial membrane potential was measured by a fluorescence microplate reader.

Results: In our study, the activation of caspase-3, and 9 increased by free 9-NC and loaded in PLGA PEG5% in treated A2780 cells. Moreover, free drug opposite of loaded form increased caspase-8 activation. Based on the above results, it appears that apoptosis induced by 9-NC in PLGA-PEG 5% occurred through caspase-9 rather than by caspase-8, the mediator of extrinsic pathway. Moreover, our results confirmed 9-NC in nanoparticles at the level of gene expression potentiated down-regulation of Bcl-2, up regulation of Bax and Smac/DIABLO.

Conclusion: The results showed that 9-NC loaded in PLGA-PEG 5% nanoparticles are able to induce apoptosis through extrinsic pathway of apoptosis. Moreover, there is potential to use PEG-9-NC NPs for treatment of ovary carcinoma. More detailed mechanism of apoptosis remains to be elucidated.

Keywords: Nitrocamptothecin, PLGA-PEG nanoparticles, Apoptosis, A2780 ovarian carcinoma

Abstract No: 430

Effect of silver nanoparticles on the physiological and biochemical properties of purslane (*Portulaca oleracea* L.) medicinal plants under salinity stress

Zahra Zaraie

Abstract

Background: Nanotechnology or using technology in the case of atoms and molecules is one of the most important techniques in present century, which will affect on future of world economy.

Methods & Materials: In this study was designed to examine effects of silver nanoparticles (50 ppm) and salinity stress (0, 100,150, 200 mM) on the growth factors and quality of Purslan plant (*Portulaca oleracea* L) was performed at the University of Urmia in 2015.

Results: The results showed that salinity up to nano+100 mM didnt showed any significant differences on RWC compared with control but increasing in salt concentration to 150 and 200 mM all mentioned decreased significantly.

Conclusion: Our results showed decrease of chlorophyll a and b by increasing NaCl concentration. Interestingly, under concomitant silver nanoparticles and salinity stress, anthocyanin level decreased compared to the control.

Keyword: Purslane (*Portulaca oleracea* L), salt stress, chlorophyll, silver nanoparticles, antosianin

Abstract No: 445

Cytotoxicity of Mesoporous silica nanoparticles as drug delivery

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Abstract

Background: Mesoporous silica nanoparticles (MSNs) have been investigated as a drug-delivery system for a decade. These nanocarriers possess unique properties such as high surface area, high pore volume, and tunable pore size. They have physicochemical stability, easily modified nanoparticles surface, low toxicity, and potential suitability for the delivery of hydrophilic and hydrophobic various active agents such as drugs, active biological agents such as proteins and genes, minerals, and so on. the carrier in drug delivery system must be inert on normal cells. In this way, Evaluation of the drug-delivery carrier's cytotoxicity is as important as its drug-delivery efficiency. Therefore, in this study the relationship of the intracellular uptake of MSNs with Normal Human Fibroblast cell line was investigated. The cytotoxicity of MSNs at low and high concentrations were studied by 3-[4,5-dimethylthiazol-2-yl]-2,5-diphenyltetrazoliumbromide (MTT) test and flow cytometry.

Results: The results of the study indicated MSNs did not show significant toxicity in various concentrations (0–500 µg/ml) on Normal Human Fibroblast cell line.

Keywords: Cytotoxicity, MSNs, drug delivery

Abstract No: 379

Water Disinfection by Titanium Dioxide Nanoparticles Photocatalytic Process

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Abstract

Background: Disinfection is one of the most important stages in water treatment. So far, various chemical disinfection methods such as chlorination had been widely used. However, these methods have serious disadvantages, like producing DBPs. Therefore, the purpose of this research was to study of effectiveness of nTiO₂ photocatalyst process on removing E.Coli as a water microbial pollution index and effects of some parameters on its efficiency.

Materials & Methods: Water was artificially contaminated with E. coli. Culture method and counting had done according to standard methods for water and wastewater and in terms of CFU/ml was reported. The size of nTiO₂ was 20 nm that was used in the presence or absence of UV for disinfection. The Kolmogorov-Smirnov Test was used to check the normality of the data. The ANOVA and T-Test was used for analyzing of data. .

Result: The results indicated that the inactivation of Escherichia coli increased with increasing in nTiO₂ catalyst dose and contact time. However, the efficiency decreased with increasing in the number of colonies. Minimum, average and maximum percent removal of nTiO₂+UV process were 75.1, 88.9±12.7, and 100 percent, respectively, with 0.8 g/L catalyst dose and 40 min contact time.

Conclusion: The bacteria mortality rate in the presence of only UV is more than only nTiO₂ process. However, the efficiency of the photocatalytic process (UV+nTiO₂) more than only UV and only nTiO₂. It means that UV light has a synergistic effect on the performance of nano-particles.

Keyword: Escherichia coli, water disinfection, photocatalyst, nTiO₂

Abstract No: 382

Absorption and distribution of ZnO nanoparticles in oral administration in rats

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Abstract

Background: The human body may be intentionally or unintentionally exposed to nanomaterials through oral ingestion, dermal absorption, intravenous injection, and inhalation. To date, only few nanotoxicology studies have investigated the effects of nanomaterials in a variety of organisms and environments. Recent years ZnO nanoparticles (ZnO-NPs) have been used in sunscreen cosmetics, dental composites, and dermal ointments. Very limited information is available on risk assessment of nanomaterials in food used in practice.

Materials & Method: This study explores the pharmacokinetics ZnO-NPs (20nm) after oral administration in mice. The ZnO-NPs uncoated were given to two groups of mice (5 per group) as a single oral dose of 50, 300 or 2000 mg/kg bw by gavage. Blood samples were collected at the following time points: time zero and 0.5, 1, 2, 4, 6, 10, 24, 48 and 72 hours after the administration. Samples of the heart, brain, liver, spleen, kidney, lung were taken 6 hours and 2 days after the administration.

Result: The results of the study demonstrate that the greatest absorption occurred after 2 hours for nanoparticles and microparticle of ZnO. The mean serum zinc levels in the first 2-6 hours of during test were significantly higher in the ZnO nanoparticle dosed groups than in the ZnO microparticle groups. The investigation of the distribution showed the zinc levels were increased during 24 to 72 hours in the liver, spleen and kidney. The more obviously increasing for ZnO-NPs than for ZnO-MPs suggest that a more efficient particle distribution concentration in these organs for NPs than for microparticles.

Conclusion: Absorption, distribution and toxicity to target organs of ZnO depended on the size of the particles and ZnO-NPs were more efficient absorbs than the larger ones.

Keywords: in vivo study, pharmacokinetic, rats, ZnO nanoparticle, Nanotoxicology.

Abstract No: 383

Effects of nickel nano particles on phenol, flavonoid and growth factors of strawberry (*Fragaria ananassa*) plants

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Abstract

Background: Strawberry (*Fragaria ananassa* Duch.) fruits contain phenolic compounds that have antioxidant, anticancer, antiatherosclerotic and anti-neurodegenerative properties. In the present study, effects of nickel nano particles were investigated on phenol, flavonoid and growth factors of strawberry plants.

Materials & Methods: The experiments were arranged in a completely randomized design with three replicates. The 30 day old Strawberry plants were treated under 4 different concentrations of NiO including 0,400,800, and 1000 mg/L. Analysis of the data was carried out using SPSS with multiple ranges as the statistical tool for comparison of means.

Results: The findings showed that under high NiO concentrations, phenol contents of the strawberry fruits significantly decreased compared to control plants but flavonoid contents reached to its maximum level at 1000 mg/L. It was also observed that different concentrations of applied NiO had no effect on leaf number and root length of plants but high concentration of NiO decreased shoot length.

Conclusion: The result indicates negative effect of nickel contamination on antioxidant activity.

Keyword: Nickel nano particles, growth aspects, strawberry, and antioxidant activity

Abstract No: 384

Effects of nickel nano particles on antioxidant activity of strawberry (*Fragaria ananassa*)

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Abstract

Background: Reducing power serves as a significant reflection of the antioxidant activity. In this study, the effect of NiO was investigated on nitric oxide radical scavenging activity, superoxide anion radical scavenging activity and reducing power capacity of strawberry fruits.

Materials & Methods: The experiments were arranged in a completely randomized design with three replicates. The 30 day old strawberry plants were treated under 5 different concentrations of NiO including 0, 200, 400, 800, and 1000 mg/L. Analysis of the data was carried out using SPSS with multiple ranges as the statistical tool for comparison of means.

Results: The result showed induction of nitric oxide and superoxide radical scavenging activities by increasing NiO nanoparticle concentration which reached to highest level at 800 and 1000 mg/L, respectively. Reducing power of fruit extracts was found to decrease with increase in NiO concentration.

Conclusion: The result indicates negative impact of nickel contamination on antioxidant activity.

Keywords: Strawberry, antioxidant activity, nitric oxide radical scavenging, reducing power assay

Abstract No: 363

Studing the Toxicity of Functionalized Mesoporous silica nanoparticles loaded with gallic acid

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Abstract

Background: Recently, applications of mesoporous silica nanoparticles (MSNs) in drug delivery have been increased. As improvements of surface properties and increase drug loading of MSNs synthesis of functionalized MSNs with suitable functional group is necessary. The aim of this study was to comprehensive study of toxicity of functionalized mesoporous silica loaded with gallic acid as natural antioxidants in treatments of disease.

Materials & Method: In this work, 3-Aminopropyl triethoxysilane (APTES) with silane and amino functional groups, were used to synthesis functionalized MSNs (AP-MSNs). Scanning electron microscopy (SEM) , Zetasizer, Zeta potential, X-ray diffraction (XRD), N₂ adsorption isotherms, Fourier transform infrared spectroscopy (FTIR), were employed to characterize and study the properties of synthesized AP-MSNs. GA was loaded into AP-MSNs and then its release into the physiology buffers by pH 7.4 were investigated. Finally, the toxicity effects of functionalized MSNs in Caco2 cells were evaluated.

Result: The results showed that the Optimum percentage of GA loaded in AP-MSN was estimated to be 43% (w/w). The amount of released gallic acid in 24 hours was 77% in pH 7.4. Finally, the effects of these nanoparticles on Caco2 cells were studied, and nanoparticles showed a significant toxic effect. Taking together, the results showed that gallic acid as natural antioxidants have an effective role in treatment of disease with the toxic effects.

Keywords: Mesoporous Silica Nanoparticles, Functionalization, Antioxidant, Gallic Acid, Toxicity

Reproductive & Developmental Toxicology

Abstract No: 552

AflatoxinB1–induced biochemical alteration in testis; evidence for AST, ALP, TAC, MDA

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Abstract

Background: Aflatoxin B1 (AFB1), produced by *Aspergillusflavus* is known as a carcinogenic agent and food contaminants. AFB1-induced cytotoxic and tissue toxic impacts are reported, previously. Present study was designed in order to illustrate the biochemical effect of AFB1 on testicular tissue.

Methods & Materials: For this purpose, 24 mature male Albino mice were divided into four groups (N=6 mice for each group) as control sham and test groups. Test groups were subdivided into 3 groups, which received 20mg/kg (intraperitoneal) AFB1 for 7, 15, 35continuous days. Animals in control sham group received same volume from solvent (0.2 ml, 95:5 corn oil/ethanol).The tissue levels of total antioxidant capacity (TAC), alkalinephosphatase (ALP), aspartate aminotransferase (AST) and malondialdehyde (MDA) were assessed and compared between test and control groups.

Results: Observations demonstrated that, AFB1 up-regulated the tissue MDA content, ALP and AST ratios, time dependently. The animals in long-time AFB1-exposed group (on day 35) exhibited the highest contents on MDA, ALP and AST. More analyses revealed that on days 15 tissue TAC was elevated, while it diminished on day 35.

Conclusion: Our data showed that AFB1 accurately on day 7 results in lipid peroxidation, which in turn stimulates the testicular antioxidant status. Meanwhile, depending on time, as a result for inflammatory responses (marked by ALP and AST) AFB1 elevates lipid peroxidation that ultimately in turn down-regulates the antioxidant status.

Keyword: Aflatoxin, Testis, ALP, AST, TAC

Abstract No: 4

Antifertility Activity of Doxorubicin in Male Mice: Protective Effect of Simvastatin

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Abstract

Background: Clinical use of doxorubicin (DOX), an anticancer drug of choice in malignant tumor chemotherapy, is limited by its substantially serious multi-organ toxicities. The aim of this work was to show whether antifertility activities of DOX could be prevented by lipid lowering agent with potent anti-oxidation capacity simvastatin (SIM).

Materials & Methods: Adult male mice were randomly assigned to four groups (n = 6). DOX was administered to two groups of mice in 5 equal intraperitoneal injections over a period of 4 weeks (accumulated dose of 20 mg/kg). One of these groups received 5 equal oral doses of SIM (accumulated dose of 60 mg/kg) along with DOX. A vehicle-treated control group and a SIM control group were also included. Epididymal sperm fertilizing capacity of all animals was evaluated following in vitro fertilization.

Result: A statistically significant reduction of in vitro fertilization success rate and blastocyst development rate was observed in the DOX-treated mice as compared to control mice. Importantly, aforementioned changes were improved to near normal level by SIM co-administration. Our data suggests that DOX-induced developmental toxicities could be prevented and/or protected by SIM.

This scientific work has been made possible by funding assistance of Urmia University.

Keywords: Doxorubicin, Simvastatin, Fertility, MouseDoxorubicin, Simvastatin, Fertility, Mouse

Abstract No: 10

Impact of Simvastatin on Doxorubicin-evoked Testicular Histopathological Lesions in Mice

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Abstract

Background: Testicular toxicity remains a serious yet unsolved complication of doxorubicin (DOX) usage in clinical oncology. The present study was designed to examine the effects of simvastatin (SIM) on histopathological abnormalities induced by DOX in mouse testis.

Methods & Materials: Adult male mice were randomly divided into four groups of six animals each. DOX was administered to two groups of mice in 5 equal intraperitoneal injections over a period of 4 weeks (accumulated dose of 20 mg/kg). One of these groups received 5 equal oral doses of SIM (accumulated dose of 60 mg/kg) along with DOX. Vehicle-treated control group and SIM-only treated group were also included. 24 hours after the last treatment, testicular tissues were taken, processed for 6 μ m sections, stained with hematoxylin and eosin and examined using a light microscope.

Results: DOX-treated mice showed drastic morphologic changes in the histoarchitecture of testis as evidenced by severe hypocellularity, seminiferous tubules atrophy, intraepithelial vacuolization, tubular lumens filling with fibrinoid debris of shredded cells and widened interstitial space with inflammatory cells infiltration and oedematous fluid accumulation. Remarkably, administration of SIM with DOX restored these morphological changes towards normalcy.

Conclusion: These findings open a window for effective prevention of DOX-related testicular damages in mice by adjuvant administration of SIM. Further studies are needed to verify the role of SIM in management of DOX-evoked testicular toxicities in human patients.

Keywords: Doxorubicin, Simvastatin, Histopathology, Testis, Mouse

This scientific work has been made possible by funding assistance of Urmia University.

Abstract No: 19

Evaluating the Protective Effect of Co-administrating of Vitamin C and Royal Jelly on Phenylhydrazine-induced Anemia's Derangements on Sperm Quality, Serum Parameters and Histological Parameters of Testicular Tissue in Mice

Running Title: Role of Vitamin C and Royal Jelly in Anemia

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Abstract

Background: Reduction in blood circulation results in pathological alterations in testicular physiologic function and spermatogenesis. Moreover, free iron ions from RBC lyses and consequently enhancement of iron ions in testicles leads to oxidative stress and affects the functions of reproductive system

Materials & Methods: Thirty two mature mice weighting 20-25gr were assigned into 4 groups including control (received 0.2mL saline normal. ip), control-sham (received phenylhydrazine (PHZ), 6 mg/100g , ip), PHZ+vitamin C (250mg/kg) and royal jelly (100mg/kg, orally) and royal jelly+Vitamin C. Following 35 days, the blood samples were obtained from hearth and the serum levels of total antioxidant capacity (TAC), malondialdehyde (MDA), Testosterone, LH, FSH, and Prolactine were evaluated. The sperm parameters including; count, motility and DNA damage, chromatin condensation were assessed as well. the tissue samples were dissected out. Following, tissue passaging, embedding, section preparation the slides were underwent to H&E staining and special staining. The capsular thickness, germinal epithelium height, TDI, RI. SPI, seminiferous tubules diameter, tubular distribution, mean average of primary spermatocytes, mean number of Leydig cells, mean number of active Sertoli cells, MNICs and mast cells number were assessed.

Results: Observations revealed a significant reduction in evaluated parameters, which was improved/inhibited in royal jelly and vitamin C co-treated group.

Conclusion: Taking together, it can be concluded that co-administrating vitamin C and royal jelly was able to inhibit the detrimental impact of hemolytic anemia in mice.

Keywords: Hemolytic Anemia, Phenylhydrazine, Vitamin C, Royal Jelly, Mice

Abstract No: 64

Evaluation the effects of Cisplatin on testicular histomorphometric in adult rat

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Abstract

Background: Cisplatin (CP) is an anticancer drug which can damage different tissues such as kidney, liver and testes. The aim of this study was to evaluate the effect of low dose of CP on spermatogenic cells.

Material & Methods: This study was performed on 14 male wistar rats that divided into 2 groups. For experimental groups was regularly fed CP for 24 hours in 7 mg/kg concentration. Treatment was carried out for 24 hours. Histological evaluation on testis section was performed by using tissue processing and hematoxylin-eosin staining and parameters of seminiferous tubules in testes.

Result: The result indicated that there were no significant differences between groups for spermatogonia, spermatocytes, spermatid, sertoli, leydig cells number and also in diameter, circumference and area of seminiferous tubules in experimental group when compared with control group.

Conclusion: We concluded that CP have not significant differences in low dose on reproductive system, it may have histopathological changes in upper dose on reproductive system, more experimental investigation are necessary to do.

Keyword: Cisplatin, Spermatocyte, Spermatogonia, Spermatid, Leydig, Sertoli

This article derived of a Research Committee in School of medicine, Hamadan University of Medical Sciences, Iran.

Abstract No: 58

Protective Effect of Royal Jelly against Phenylhydrazine-induced Small Intestine Injury in Mice: Morphometric Analyses

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Abstract

Background: Phenylhydrazine (PHZ), a well-known hemolytic agent, causes toxicity on various tissues at various levels. The aim of the current study was to examine the possible protective effects of royal jelly (RJ) against PHZ-induced small intestine injuries in mice.

Methods & Materials: Adult male mice were randomly assigned to four groups of eight mice each. PHZ was administered to two groups of mice at a dose of 6 mg/100gr per 48 hours intraperitoneally for 35 days. One of these groups received RJ (100 mg/kg per day) orally four hours before PHZ administration. A vehicle-treated control group and a RJ control group were also included. 24 hours after the last treatment, desired segments of small intestines were dissected out and subjected to histological processing. PHZ caused significant decreases in crypts depth of duodenum, distribution rate of the goblet cells in ileal villi, villi width of duodenum and jejunum and height of villi in all segments of small intestine.

Results: Co-administration of RJ partially improved all changes in the above-noted parameters. RJ as a free radical scavenger may alleviate PHZ-induced intestinal toxicities in mouse.

Keyword: Royal Jelly, Phenylhydrazine, Small intestine, Mouse

This scientific work has been made possible by funding assistance of Urmia University.

Abstract No: 73

Protective Role of Ethyl Pyruvate on Sperm Fertility of Mice Infected with Hemolytic Anemia Resulting from administrating Phenylhydrazine

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Abstract

Background and aims: The reports were showed that oxygen shortage is one of the harmful factors on testis especially the efficacy of sperms. This hypoxia can be made due to ailment conditions such as different kinds of anemia, poisonings, working in places with shortage of oxygen or living in high places. Since Phenylhydrazine (PHZ) is known as a proper substance in making of anemia condition, it is used in this study. In this survey, the aim is to investigate the protective role of Ethyl Pyruvate on the sperm fertilizing amount of animals concerned with hypoxia resulting from induced hemolytic anemia by PHZ and based on “In Vitro Fertilization” or IVF.

Materials & Methods: 24 adult mice (weighing 25-20 gr at 6 to 8 weeks of age) were divided equally into 4 groups in that group 1, control group, that received normal saline (0.1ml, IP). The group 2 was received phenylhydrazine (PHZ) with dose of 8mg/100 gr b. w, IP at first time and followed by 6mg/100 gr b. w/48h, IP. The group 3 received ethyl pyruvate (40 mg/kg, IP) along with PHZ and the group 4 received only ethyl pyruvate (40 mg/kg, IP). After 35 days, the sperm samples were collected from the epididymis and were induced using IVF methods with healthy oocytes.

Results: The results indicate the considerable reduction of fertilized oocytes, two-cell zygote as well as blastocyst, and the number of arrested zygotes in PHZ group. But ethyl pyruvate could improve the IVF results in some extent.

Conclusion: These results suggested the protective effect of ethyl pyruvate on oxidative stress caused by hypoxia-induced hemolytic anemia with PHZ on the IVF of mice sperm.

Keyword: Phenylhydrazine, Hemolytic anemia, Ethyl pyruvate, IVF

Abstract No: 32

Genetic polymorphism of cytochrome p450 (2C19) enzyme in Iranian Baluch ethnic group

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Abstract

Background: Interindividual differences in the metabolism of many drugs and poisons in humans are depended on genetic polymorphisms. The aim of this study was to determine the CYP2C19 genotype profiles of Baluch ethnic group by studying allelic differences and compare their frequencies with results of other studies in different populations.

Methods & Materials: One hundred and forty unrelated healthy Baluch origin people who were referred to Health Center in Chahbahar, in Sistan and Baluchestan province enrolled in the study. Polymerase Chain Reaction-Restriction Fragment Length Polymorphism technique was used for Genotyping of CYP2C19 gene.

Results: The allele frequency of CYP2C19*1, CYP2C19*2 and CYP2C19*3 were 88.93%, 10% and 1.07%, respectively. 78.57% of subjects were with CYP2C19*1/*1 genotype. 20%, 0.71% and 0.71% subjects were with CYP2C19*1/*2, CYP2C19*1/*3 and CYP2C19*3/*3 genotypes, respectively. 0.71%, 20.71% and 78.57% of subjects were poor, Intermediate and extensive metabolisers. The allelic variants of CYP2C19*2 and CYP2C19*3 in Baluch ethnic group are comparable to other different population. CYP2C19*1 was the most frequently allele (88.93%) in our subjects.

Conclusion: It is important to study the clinical significance of those variations for optimal drugs dosage which metabolize by the CYP2C19 enzymes in response to different substrates such as S-mephenytoin, methylphenobarbital, omeprazole, phenytoin, imipramine, proguanil, propranolol, and diazepam. These findings may help clinicians to make a choice and suitable plan for the optimal dosage of some drugs and reduce drug side effects and intoxication.

Keyword: CYP2C19 genetic polymorphism, Baluch ethnic group, polymerase chain reaction–restriction fragment length polymorphism (PCR-RFLP).

Abstract No: 95

Effect of zearalenone on early pregnancy in guinea pigs

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Abstract

Background: Female guinea pigs were tested to determine whether they could serve as a model of zearalenone (ZEN) toxicosis during early pregnancy, as observed in domestic swine.

Methods & Materials: Only 1 of 4 female guinea pigs that were given 21 mg of ZEN/kg of body weight orally during the first 8 days after mating was pregnant when examined 22 days after mating. Guinea pigs that were given 7 or 14 mg of ZEN/kg had normal fetal development. Serum concentrations of progesterone were less than 12 ng/ml in all guinea pigs 8 and 15 days after mating. Serum concentrations of progesterone were greater than 100 ng/ml in pregnant guinea pigs on day 22, but remained less than 12 ng/ml in nonpregnant guinea pigs. Three of 5 guinea pigs treated with 20 mg of ZEN/kg and only 1 of 4 guinea pigs given 30 mg of ZEN/kg on days 1 to 3 after mating were pregnant 22 days after mating. Female guinea pigs treated with 20 or 30 mg of ZEN/kg on days 4 to 5 or 6 to 8 after mating and female guinea pigs treated with 60 or 90 mg of ZEN/kg on days 4 and 5 after mating had normal pregnancies.

Results & Conclusion: Serum concentrations of progesterone were less than 10 ng/ml in all guinea pigs on day 15 and remained low on day 22 only in nonpregnant guinea pigs.

Keyword: zearalenone ‘early pregnancy ‘guinea pigs

Abstract No: 173

Antiproliferative effect of arsenic trioxide on gastric carcinoma

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Abstract

Background: Arsenic trioxide (ATO) is a drug of choice for the treatment of acute promyelocytic leukemia and its antineoplastic effect is being studied in other cancers. In this study, we evaluated the anticancer effects of ATO on gastric adenocarcinoma in cellular and molecular scale.

Materials & Methods: MTT assay and flow cytometry were carried out to appraise the effect of ATO on cell viability and apoptosis respectively. Gene expression of p21 was measured using real-time PCR. All the experiments were performed in triplicate and the data are shown as mean \pm SD. Statistical significances of difference throughout this study were calculated using a Student's t-test and by one-way variance analysis. P values <0.05 were considered significant.

Results: ATO significantly diminished viability of gastric adenocarcinoma MKN45 cell line. Moreover, analysis of flow cytometry data indicates that ATO increases G2/M arrested cell population thus inducing apoptosis which is in consistence with the data from real-time PCR which demonstrates an increase in p21 gene expression.

Conclusion: ATO, alone or in combination with other drugs, could be a potent anticancer agent for targeting gastric cancer.

Keyword: arsenic trioxide, Gastric carcinoma, p21, apoptosis

Abstract No: 165

Toxicity mechanisms of Autism on brain using Isolated Mitochondria

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Abstract

Background: Autism is characterised by a combination of behavioural abnormalities in three areas: social relations, communication and motor activity. Additional associated features are common. For example, mental retardation is present in about 75% of the patients, and anxiety is frequent.

Methods & Materials: Two groups of young Western albino male rats weighing about 45 to 60 grams were used in the present study. The first group consisted of oral buffered PA-treated rats that were given aneurotoxic dose of 250 mg/kg body weight/day for three days, n = eight; the second group of rats were given onlyphosphate buffered saline and used as a control. Rat mitochondria were obtained by differential ultracentrifugation and incubated.

Results: Our results showed induced a rise inmitochondrial ROS formation, lipid peroxidation and mitochondrial membrane potential collapse before mitochondrial swelling ensued in isolated brain mitochondria. Disturbance inoxidative phosphorylation was also confirmed by decrease in ATP concentration in the Autism treatedmitochondria. In addition, collapse of mitochondrial membrane potential (MMP) andmitochondrial swelling caused release of cytochrome c via outer membrane rupture or MPTpore opening.

Conclusion: Our results suggested that Autism -induced toxicity in brain tissue is the resultof disruptive effect on mitochondrial respiratory chain that leads to ROS formation, lipidperoxidation, mitochondrial membrane potential decline and cytochrome c expulsion whichstarts apoptosis signaling and cell loss.

Keyword: Autism; isolated mitochondria; mitochondrial dysfunction; Cytochrome c release

Abstract No: 156

Aflatoxin b1 effects on ovarian follicular growth

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Abstract

Background:

Methods & Materials: For this investigation, 28 female healthy adult Wistar rats were selected. The animals were divided into four groups (n = 7 per group): control, test group 1, test group 2 and test group 3. Each rat in test groups 1, 2 and 3, received 0.8 ppm, 1.6 ppm and 3.2 ppm aflatoxin B1 (AFB1), respectively, via gavage for a period of 25 days. The control group received distilled water only. All tissue specimens were processed for routine paraffin embedding and serial cross-sections cut at 5–7 µm and stained with haematoxylin–eosin. Both histomorphologic and histomorphometric analysis was performed under light microscopy. An increase in the concentration of AFB1 resulted in a reduction in the population of healthy primordial, primary, secondary and tertiary follicles. The greatest reduction was in seen in group 3 (with 3.2 ppm AFB1/day). In all test groups, due to an increase in AFB1 concentration, in both the right and left ovaries, all types of atretic follicles, including primordial, primary, secondary, and tertiary atretic follicles were significantly increased ($P < 0.01$). In conclusion, AFB1 is toxic for all type of ovarian follicles, including non-growing and growing follicles and exerts an atretogenic effect on all types of ovarian follicles.

Results: The atretogenic effect of AFB1 is dose dependant. Due to its toxic effects (gametotoxicity), the resting pool of ovarian follicles (primordial follicles) decreases significantly. The ovulatory follicular population either decreases or is completely depleted.

Keyword: Rat, Follicular atresia t, Aflatoxin B1, Follicular growth

Abstract No: 211

Isolation, sequencing and cloning of the gene encoding Microcin E492 as a microbial toxin

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Abstract

Background: Microcin E492 is a low molecular weight channel-forming microbial toxin that is produced by *Klebsiella pneumoniae*. This peptide has a relatively wide range of application in medicine and is active in some strains of the family Enterobacteriaceae. The present study was carried out to detect the gene encoding Microcin E492 in *Klebsiella pneumoniae*, sequencing and cloning in prokaryotic systems.

Materials & Method: *Klebsiella pneumoniae* was obtained from the Hospital of Esfahan province and was cultured on MacConkey agar. Isolated colonies were studied using PCR techniques to detection and sequencing of the gene encoding Microcin E492. Gene was cloned in the bacterial host *Escherichia coli* Top10F by vector pET22b (+). Finally, plasmid DNA was extracted and sequenced. After culturing bacteria, successive PCR reactions and reviews of specific product using electrophoresis, ultimately, the gene encoding Microcin E492 was purified and sequenced. Nucleotide sequences were obtained closely related Microcin E492 gene. Gene was cloned in the bacterial host *Escherichia coli* Top10F by vector pET22b (+). Finally, plasmid DNA was extracted and sequenced.

Result: In this study Microcin E492 gene, successfully sequenced and clone. Sequencing results confirmed the correctness of the cloning.

Keyword: Microcin E492, Biological antibiotics, microbial toxin

Abstract No: 208

Gallic acid prevents memory deficits and oxidative stress induced by intracerebroventricular injection of streptozotocin in rats

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Abstract

Background:

Materials & Method: In the present study, we evaluated the effects of gallic acid (GA; 30 mg/kg, orally, once daily for 26 days starting from day 5 prior to streptozotocin injection) on cognitive impairment and cerebral oxidative stress induced by intracerebroventricular-streptozotocin (ICV-STZ; bilaterally, two doses of 3 mg/kg) injection as an animal model of sporadic Alzheimers type (SDAT) in rats.

Result: The results showed that ICV-STZ-injection reduced the passive avoidance and spatial memory performance associated with decreased non-enzymatic [total thiol concentration, -58.5%, -50.7%] and enzymatic [superoxide dismutase (SOD, -30.2%, -32.9%), catalase (CAT, -43.5%, -50.7%), glutathione peroxidase (GPx, -57.1%, -61.7%)] activities and increased the level of thiobarbituric acid reactive species (TBARS, +103.5%, +82.5%) in the hippocampus and cerebral cortex, respectively. In contrast, chronic administration of GA significantly prevented cognitive deficits and biochemical alterations in the ICV-STZ rats.

Conclusion: These findings highlight the beneficial role of GA in the ICV-STZ rats via enhancement of cerebral antioxidant defense system. Thus, it may have a therapeutic value for the treatment of SDAT.

Keywords: Gallic acid, ICV-STZ, Spatial memory, Passive avoidance memory, Oxidative stress, Rat

Abstract No: 228

Histo-anatomical and developmental evidences for formaldehyde toxicity in feto-placental unit of mice

Ali Louei Monfared, Ali Akbar Hosseinizadeh

Abstract

-Background: formaldehyde (FA) is one of chemical materials that which is used highly in medical and industrial affairs. The purpose of present research is studying the harmful effects of FA on anatomical and histological aspects of feto-placental unite and developmental toxicity of fetus in mice.

Methods: For this experiment 60 pregnant Balb/C mice were divided into three experimental and one control groups. In treatment groups, FA was administrated at concentrations of 0.2, 0.4 and 0.8 mg/kg by gavage for 2 months. At the end of study, the mice were anesthetized; the fetus and their placentas were removed. Weight, diameter, thickness of placenta, weight, ratio of placental weight to fetal weight were determined and statistically analyzed. Also any probable anomalies of placenta and fetuses were studied. For histological assay after routine tissue procedures, the total structural changes of placenta were studied.

Results: In treated mice, decrease in gestational body weight, significant decrease in body weight changes and decrease in fetal weight were seen in comparison to control mice ($P>0.05$). Also, significant increasing in placental weight, diameter, and the ratio of placental weight to fetal weight were seen. Histological changes included increasing in the diameter of labyrinth inter hemal membrane (LIM); increasing in number and size of trophoblastic giant cells, congestion and apoptosis of villous cytotrophoblast cells were seen in FA treated mice.

Conclusion: By using of results of present study it can be prognoses the harmful effects of FA for individuals working with chemical especially pregnant women.

Keywords: Formaldehyde, fetus, placenta.

Abstract No: 267

High resolution melting method to detect single nucleotide polymorphism of CYP2C9

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Abstract

Background: Warfarin is the most commonly prescribed oral anticoagulant drug for prophylaxis and treatment of venous and arteriole thromboembolic disorder. Its anticoagulant effect is widely variable between patients because of pharmacodynamic pharmacokinetic and pharmacogenetic factors, this study designed to evaluate the allele and genotype frequencies of CYP2C9 and VKORC1 in Iranian volunteers.

Materials & Methods: in this study after DNA-extraction with salt out method, the frequency of two genes Alleles and genotype investigated with HRM (High Resolution Melting). Real-Time PCR. Data Analysis was done with X2 test on SPSS.17.00 statistical package.

Result: The frequencies of each polymorphism in Iranian population were found as 0.1425 and 0.0425 for CYP2C9*2 (8633C>T), CYP2C9*3 (47639A>C) respectively. Vkorc1 polymorphism (-1639G>A) were analyzed. -1639G and -1639A allele frequency in study population were 52% and 48%. And genotype frequencies were GG(25.5%), GA(53%) and 21.5%). This allele frequency had significant differences with other populations.

Conclusion: HRM technique could distinguish the genotypes of CYP2C9 and VKORC9 enzymes with high sensitivity. This technique is simple, fast and cost-effective for SNP genotyping of these two genes.

Keywords: SNP, CYP2C9, HRM PCR

Abstract No: 271

Anatomical and Histological Analysis of the Ovary Changes in Mice Following Phenol Administration

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Nooraei

Abstract

Background: Phenol is one of the most important disinfectant chemicals that applying in medicine and different industries. Regarding to exposing of individuals including women with phenol, a histomorphologic study of the ovary and probable its toxic effects is necessary. The morphological changes in the ovarian follicles produced by the toxic effect of phenol were analyzed.

Materials & Methods: For this experiment 40 female Balb/C mice at the age of 8 weeks and weight of 38 ± 4 g were divided into three experimental and control groups. In treatment groups, phenol was administrated at concentration of 80, 180 and 320 mg/kg/BW respectively by gavage for 45 days. The control group received only tap water by similar methods and duration. At the end of the experiment, the mice were anesthetized, the ovaries were removed, weighted and after tissue processing, the specimens were studied histomorphologically and results were statistically analyzed.

Results: The results showed that phenol administration decrease the number of secondary and graafian follicles and also increase the number of atretic follicles in the ovary ($P < 0.05$) in comparison to the control. The histological changes were dose dependent. In treated mice, the absolute and relative weight of ovary was not affected in compare with control mice ($P > 0.05$).

Conclusion: According to the results of study, concluded that phenol exposing has harmful and dangerous reproductive results for females.

Keywords: Phenol, Ovary, Histomorphology

Abstract No: 482

Frequency Evaluation of A4889G (m2) Polymorphism of CYP1A1 Gene in a Healthy Population from Mazandaran Province, Iran

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Abstract

Background: Cytochrome P450 (CYP 1A1) is important phase I xenobiotic metabolizing enzyme involved in the metabolism of numbers of toxins, endogenous hormones, and pharmaceutical drugs. Polymorphisms in this phase I gene can alter enzyme activity and induction, also are known to be associated with cancer susceptibility related to environmental toxins and hormone exposure. The present study was aimed to determine the frequency of commonly known functional polymorphism of CYP1A1 gene including CYP1A1 m2 (Ile-Val), A→G transition in a healthy population from Mazandaran province of Iran.

Methods & Materials: A total of 200 unrelated healthy subjects from Mazandaran province, residing in Tonekabon, coming for blood donating at Tonekabon Blood Transfusion Center were enrolled. A total of 2 ml of peripheral blood was taken from individuals. Genomic DNA was extracted using DynaBio TM Blood/Tissue DNA Extraction Mini Kit .All subjects were genotyped for CYP1A1 m2 (A>G) (rs1048943) by polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP).

Results: The frequencies of the AA (wt/wt) , AG(wt/mt) and GG(mt/mt) genotypes were as 84.5% , 15% and 0.5% respectively. The frequencies of A and G allele in Iranian population (Mazandaran province, Tonekabon) were 92% and 8% respectively.

Conclusion: Results of the present study might be important in understanding the distribution of CYP1A1 (m2) polymorphism in Mazandaran province of Iran. Moreover, these results may determine the susceptibilities in individuals towards environmental procarcinogens that result in several cancers.

Keywords: Cytochrome P450, CYP1A1, Polymorphism, Iranian population, Toxicogenetic.

We are thankful to the University (MAZUMS) Grant Commission, Sari, Iran, for funding.

Abstract No: 222

Ellagic Acid, A Component Of Propolis Induces Apoptosis via Mitochondrial Pathway and ROS Formation in Human Chronic Lymphocytic Leukemia Cells.

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Abstract

Materials & Methods: To investigate the effects of ellagic acid on the viability of peripheral blood lymphocytes isolated from B-CLL patients and peripheral blood mononuclear cells (PBMC) from healthy individual. Lymphocytes were incubated with various concentration of ellagic acid for 24 hours. Flow cytometric assay was used to measure the percentage of apoptosis versus necrosis by annexin V and propidium iodide staining assay. Intracellular ROS production, mitochondrial membrane potential ($\Delta\Psi_m$) in both groups intact cells (CLL and PBMC) after exposure to ellagic acid was measured. The molecular mechanism of ellagic acid-induced apoptosis was also investigated. We isolated mitochondria from both groups cells (CLL and PBMC cells) and parameters of mitochondrial toxicity such as collapse of mitochondrial membrane potential, mitochondrial swelling, the raise of active oxygen radicals and finally release of cytochrome c was investigated.

Results: Based on our results ellagic acid decreased the percentage of viable cells and induced apoptosis. Ellagic acid increased ROS formation, mitochondria swelling, mitochondrial membrane potential decrease ($\Delta\Psi_m$) and cytochrome c release from isolated mitochondria obtained from CLL patients BUT NOT healthy subject. The induction of apoptosis also confirmed by annexin V double staining and flow cytometry assay.

Conclusion: Our results demonstrated that treatment with ellagic acid caused cytochrome c release in the mitochondria obtained from CLL cells while pre-treatment with cyclosporine A (an inhibitor of MPT pore) or BHT (Butylated hydroxytoluene) prevented this effect. Taken together, we suggest that ellagic acid induced cytotoxic effects on CLL cells selectively and not on PBMC cells obtained from healthy subjects. These results suggest that ROS production causes opening of MPT pores in mitochondria and finally release of cytochrome c and activation of caspase. The

later leads to the induction of apoptosis on B-CLL cells. The induction of apoptosis by ellagic acid may provide a pivotal mechanism for its anti-cancer action in CLL patients.

Keyword: Ellagic Acid, Apoptosis, Chronic Lymphocytic Leukemia, Mitochondria

Abstract No: 247

An investigation of the effect of phosalone on oxidative stress and inflammatory biomarkers in rat embryonic fibroblast cells

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Abstract

Background: Cellular senescence induced by oxidative stress has been regarded as an excellent in vitro model for aging research. The current study was designed to investigate the effect of organophosphorus (Ops) compounds on aging model in rat embryonic fibroblast cells (REF) to evaluate the cellular and molecular mechanisms of toxicity. Widespread use of phosalone has caused a serious concern in the world since they can enter into food chain and living systems and cause several health problems.

Materials and Methods: Mouse embryonic fibroblast (REF) cell fibroblast cells were isolated, cultured and treated with different concentrations of phosalone. After 24 hours incubation, the viability of the cells evaluated by MTT assay then the level of cell oxidative was assayed by malondialdehyde (MDA), pro-inflammatory markers including tumor necrosis factor- α (TNF- α), interleukine-1 β (IL- β) and antioxidant power (TAP) were assessed in REF.

Results: This study show that exposure REF cell to organophosphorus (Ops) compounds induced oxidative stress in vitro model of aging research. Phosalone compound caused an increase in MDA level, TNF- α , IL-1 activities and decrease in TAP level but that are not in dose-dependent manner. Taken together, we need more investigation for determine the exact effect of phosalone on REF cell.

Conclusion: Cellular senescence in vitro has been regarded as a useful model for elucidating molecular mechanisms that underlie organismal aging. In addition to replicative senescence, cellular senescence can also be induced by various stresses including oxidative stress oxidative stress-induced senescent cells serve as an excellent in vitro tool for aging research.

Keywords: Organophosphorus, Phosalone, Toxicity, Rat embryonic fibroblast cells, aging

Abstract No: 265

Toxicity Test of *Sargassum glaxcesens* in histometrical and spermatogenesis parameters in Adult male Japanese quill testicular tissue

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Abstract

Background: *Sargassum glaxcesens* is one of the most abundant algae, introduced newly from the Persian Gulf. It can be used in phytomedicine, food industry as food additive and poultry diet. The aim of this study was toxicity test of this algae in adult male Japanese quill testicular tissue. The testis is an important organ that affected in many poisoning and Quill is one of the laboratory animal models.

Materials & Methods: 20 male adult quill that was used in this study, were grouped into 5 (each group, n=4), i.e. control group (no algae diet), 4 groups received *Sargassum* 1%, 2.5%, 5% & 7.5% in diet respectively. Experimental birds were anesthetized by using chloroform inhalation in closed chambers after 42 days of treating and then the necropsied technique were applied to remove the testis. After collecting the testes, they were fixed in Bouin's fixative and were stained with H&E. histometrical parameters such as: Seminiferous Tubules Diameter (STsD) and Germ cell Epithelium Height (GEH) and spermatogenesis parameters such as: TDI (Tubule Differentiation Index), SPI (Spermiation Index) and RI (Repopulation Index) were evaluated.

Results: Investigation of histometrical and spermatogenesis parameters was showed that GEM was significantly increased in all *sargassum* groups in comparison with control group ($p>0.05$). But in *sargassum* groups, GEM demonstrated any difference. STsD showed any significant difference between all groups. All spermatogenesis parameters in *sargassum* groups were increased nonsignificantly compared to control group.

Conclusion: According to this study, *Sargassum glaxcesens* has no toxic effects on testicular tissue in Japanese quill and it can be used as food additives in food industry.

Key words: *Sargassum glaxcesens*, Japanese quill, testicular tissue.

This research was financially supported by the research council of Shahid Bahonar University of Kerman

Keyword: *Sargassum glaxcesens*, Japanese quill, testicular tissue.

Abstract No: 409

Evaluation of the reproductive ability of male rats treated with Lorazepam

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Abstract

Background: Lorazepam (Ativan), a benzodiazepine with antianxiety, sedative, and anticonvulsant effects. Benzodiazepines are widely used in the treatment of insomnia, anxiety, and epileptic disorders. The purpose of this study was to determine the effect of lorazepam on the testosterone levels and histological changes of testis in adult rats.

Materials & Methods: In this experimental study, 12 adult male Wistar rats were randomly divided into two groups: control group which treated with normal diet and the experimental group received 10 mg/kg of Lorazepam via gavage feeding once daily for 4weeks period. At the end of treatment period, the animal were anastayzied and blood samples were prepared for testosterone measurement and the testis were removed to formalin 10% for histological studies. Tissue sections were prapared and stained with H & E, then studied with light microscopy.

Results: The results of the present study showed that diameter of seminiferous tubules and thickness of epithelium of seminiferous tubules significantly decreased ($P<0.05$), but thickness of interstitial tissue and thickness of testicular significant increased ($P<0.05$) compared to controls.

Conclusion: Results showed that Lorazpam has negative effect on the reproductive system in male rats.

Keywords: Lorazpam, Benzodiazepine, Testosterone, Male Rat

Abstract No: 413

Nicotine-induced apoptosis; correlation with p53, Bcl-2 and caspase III expression in rats testicular tissue

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Abstract

Background: Cigarette has a rather obvious effect on spermatogenesis, which may be due to nicotine metabolite that produces a dose-dependent decrease in androstenedione and testosterone concentrations. However, the possible roles of protooncogens, tumor suppressors and apoptosis-promoters in nicotine-induced derangements remained unclear.

Methods & Materials: For this purpose, 18 mature male Wistar rats were divided into control and experimental groups. The nicotine was dissolved in injectable sterile distilled water and administered to the rats at daily doses of 0.2mg/kg and 0.4 mg/kg body weight, through intraperitoneal (i.p.) route, for 48 days. The animals in control group received the vehicle alone for 48 days. The immunohistochemical expressions of the p53, Bcl-2 and caspase III proteins were estimated.

Results: The cells with protein expression were counted per 100 cells in different layers of the germinal epithelium and compared between groups. The spermatogonia, spermatocytes and spermatids exhibited increased p53 and caspase III expression versus control animals. More analyses for Bcl-2 showed a remarkable ($P<0.05$) reduction in Bcl-2 protein at spermatogonia and spermatocytes levels. All impairments enhanced dose dependently.

Conclusion: In conclusion, nicotine by up-regulating the expression of p53 protein inhibits/prevents the cell survival through Bcl-2 pathway. Therefore, by this mechanism it is able to promote the extrinsic pathway for apoptosis via provoking the caspase III expression.

Keywords: Nicotine, p53, Bcl-2, Caspase III, Spermatogenesis, Testis

Abstract No: 415

Investigation of Botulinum Toxin Complex as a Vehicle for Oral Administration of Insulin

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Abstract

Background: Botulinum toxin a toxin from *Clostridium botulinum* causes highly fatal disease called botulism. This toxin consists of a complex mixture of proteins containing botulinum neurotoxin and various non-toxic neurotoxin-associated proteins (NAPs). The NAPs composed of four clostridial proteins; a non-toxic non-hemagglutinin (NTNHA) protein that directly interacts with BoNT and keeps the toxin safe through the gut and three hemagglutinin proteins (HAs) which interact with intestinal epithelial cells and play an important role in BoNT transport. The toxin protection mechanism will make possible the design of novel proteinaceous vehicles for oral administration of drugs that currently must be injected. In the current study we investigate the assembly of NAPs and insulin into the insulin complex that protects insulin from harsh environment of the gastrointestinal (GI) tract and facilitate its delivery into the bloodstream. The replacing of BoNT coding gene by insulin coding sequence enable *Clostridium botulinum* to produce insulin complex instead of botulinum complex.

Methods & Materials: At the first step ntnha warily mutated so that the binding site for insulin inserted in its sequence, then in order to predict its 3D structure, new sequence was modeled using Homology modeling. At the second step Hex software was used for studying interactions of insulin with mutated ntnha.

Results & Conclusion: Our results showed that mutated ntnha mimicking insulin binding domain in insulin receptor interacted with insulin and essential interactions for transporting insulin by NAPs created using gene manipulation.

Keywords: Botulinum Toxin, Insulin, Homology Modeling

Abstract No: 399

Effect of aflatoxin-B1 on testicular tissue; Evidence for the roles of p21, estrogen receptor alpha (ER α) and cyclin D1

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2- Department of Comparative Histology & Embryology, Faculty of Veterinary Science, Urmia University, Urmia, Iran

Abstract

Background: Aflatoxin-B1 (AFB1) is a highly oxygenated and heterocyclic compound that could be present in human foods and animal feedstuffs and is an important mycotoxin produced by the fungi *Aspergillus flavus*, *A. parasiticus* and *A. nomius*. Considering the increasing warning about the AFB1-induced cytotoxicity, here in present study we aimed to uncover the possible roles of p21, ER α and cyclin D1 proteins in AFB1-exposed testicles.

Materials & Method: AFB1 was dissolved in corn oil and ethanol (95:5, v/v) and administered (intraperitoneally) to the mice at a daily dose of 20 μ g/kg body weight, for 7, 15 and 35 days. Mice in the single control group received the vehicle alone for 35 days. The immunohistochemical expression of the p21, ER α and cyclin D1 proteins were estimated. The cells with protein expression were counted per 100 cells in different layers of the germinal epithelium and compared between groups.

Result: The spermatogonia cells exhibited reduced ER α expression, enhanced p21 and cyclin D1 proteins on days 7, 15. However, the expression of the cyclin D1 and ER α significantly decreased 35 days after exposing. The expression of these proteins in spermatocytes and spermatids was totally different with spermatogonia. No cyclin D1 expression was revealed in spermatocytes, while the expression of p21 increased, time dependently. The spermatids showed reduced expression of cyclin D1 and ER α associated with severe increase in p21 expression, time dependently.

Conclusion: In conclusion, AFB1 by reducing the ER α receptors in various lesions of germinal epithelium enhanced the apoptosis promoters such as cyclin D1 and p21 expression. Current research was supported by Urmia University.

Keyword: Aflatoxin, p21, ER α , cyclin D1, Spermatogenesis, Testis

Abstract No: 405

The effect of sulfur intoxication of pregnant rats on the Serum concentration of immunoglobulins in their newborns

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Abstract

Background: sulfur toxicity is related to its high concentration and its toxic gaseous compounds related in to environment. As environmental contaminants, sulfur compounds have devastating effects on human health and embryos wellbeing. Therefore, this study was carried out to evaluate the impacts of sulfur intoxication of pregnant rats on the Serum concentration of immunoglobulins in their newborns.

Materials & methods: In this experimental study, 36 female rats were divided into three groups: the control group, left untreated before and during pregnancy, and mild and severe intoxication groups which received sodium sulfide compound at a dose of 500 mg/kg body weight for 15 and 30 days before and during pregnancy respectively. The daily administration of sodium sulfide was through drinking water. After pregnancy and following a 40 day period after birth, blood samples were taken from male and female newborns of the control and intoxicated mothers. The method of nephelometry was used to measure the serum levels of IgG and IgM immunoglobulins. The obtained data was analyzed statistically by software SPSS version 17.

Results: The results showed a significant increase in the concentrations of IgG and IgM immunoglobulins In male and female newborns with Severe maternal toxicity as compared to the control group ($p \leq 0.05$). On the other hand, there was no significant differences in the concentration of immunoglobulins in female newborns of all groups than the corresponding male group.

Conclusion: Based on the findings of this research, sulfur intoxication of rats during pregnancy induces similar changes in the function of immune system of both male and female newborns. These changes are observed as significant increases in the serum levels of immunoglobulins IgG and IgM in male and female newborns ($P \leq 0.05$).

Keyword: Sodium sulfide, newborn, rat, immunoglobulin, IgG, IgM

Abstract No: 485

Frequency Evaluation of T6235C (m1) Polymorphism of CYP1A1 Gene in a Healthy Population from Mazandaran Province, Iran

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Abstract

Background: Cytochrome P450 (CYP 1A1) is important phase I xenobiotic metabolizing enzyme involved in the metabolism of numbers of toxins, endogenous hormones, and pharmaceutical drugs. Polymorphisms in this phase I gene can alter enzyme activity and induction, also are known to be associated with cancer susceptibility related to environmental toxins and hormone exposure. The present study was aimed to determine the frequencies of commonly known functional polymorphism of CYP1A1 gene including CYP1A1m1 (MspI), T→C transition in a healthy population from Mazandaran province of Iran.

Methods & Materials: A total of 200 unrelated healthy subjects from Mazandaran province, residing in Tonekabon, coming for blood donating at Tonekabon Blood Transfusion Center were enrolled. A total of 2 ml of peripheral blood was taken from individuals. Genomic DNA was extracted using DynaBio™ Blood/Tissue DNA Extraction Mini Kit. All subjects were genotyped for CYP1A1 m1 (T>C) (rs4646903) by polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP).

Results: The frequencies of the TT (wt/wt), TC(wt/mt) and CC(mt/mt) genotypes were as 65.5%, 32.0% and 2.5% respectively. The frequencies of T and C allele in Iranian population (Mazandaran province, Tonekabon) were 81.5% and 18.5% respectively.

Conclusion: Results of the present study might be important in understanding the distribution of CYP1A1 (m1) polymorphism in Mazandaran province of Iran. Moreover, these results may determine the susceptibilities in individuals towards environmental procarcinogens that result in several cancers.

KeyWord: Cytochrome P450, CYP1A1, Polymorphism, Iranian population, Toxicogenetic

Abstract No: 462

Evaluation of protective effect of human placenta extract on preventing acute damage on kidney in rat and liver in mice

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2-Transplant Research Center, Shiraz University of Medical Sciences, Shiraz, Fars, Iran

Abstract

Background: Human placenta has been a historical folk remedy in Oriental medicine for the treatment of physiological abnormalities in human organs. The aim of the present study was to evaluate the effects of aqueous-saline human placenta extract (HPE) on acetaminophen-induced hepatotoxicity, cisplatin-induced nephrotoxicity using in vivo model.

Methods & Materials: For hepatotoxicity mice received 100 and 200 µg/kg of the HPE by i.p. injection as a single dose, 0.5 h after the injection of acetaminophen 300 mg/kg (i.p.). For nephrotoxicity rats received 500 µg/kg of the HPE by i.p. injection for 5 consecutive days after the injection of cisplatin 5k/kg (i.p.). After 24h of last injections, the animals were sacrificed and the related organ tissues were collected for Determination of lipid peroxidation and glutathione, biochemical and histopathological examinations. HPE decreased LFT result, enzyme of kidney and the levels of tissue damages in liver and kidney and lipid peroxidation after APAP and cisplatin administration respectively.

Results: It also increase glutathione in liver after APAP administration. Its cytoprotective effect against APAP and cisplatin could be by one or several mechanisms such as: antioxidant effects; scavenging free radicals responsible for cell damage; or induction or regeneration of the liver and kidney cells. Total volume of the alveolar septum and its thickness in lung increased and the total volume of alveolar space was decreased 31% in amiodarone treated-rats. The results showed the HPE itself was not toxic for animals and could protect the liver and kidney against acetaminophen and cisplatin respectively.

Conclusion: Therefore, the results of the present study support the traditional believes on organ function improvement effects of human placenta extract.

Keyword: Human placenta extract; Acetaminophen; Cisplatin; Organ toxicity

Abstract No: 326

Paclitaxel-induced hepatotoxicity and the role of E2f1 and c-Myc transcription factors

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Abstract

Background: Paclitaxel (Taxol, TXL) as an anti-cancer drug disrupts the cellular mitotic processes via interposes with microtubule depolymerization. It is widely used against solid tumors such as ovarian, breast, lung and prostate cancers. Previous histopathological studies have shown the hepatotoxicity of TXL, however there is little is known about the molecular pathway(s) of TXL hepatotoxicity. Therefore this study aimed to uncover the role of two regulators of cell signaling in TXL-induced hepatotoxicity in rats. Moreover, the hepatoprotective effect of royal jelly (RJ) on TXL-induced toxicity was also investigated. Wistar rats were divided into control and test groups.

Materials & Methods: The test group was assigned into five subgroups, which the first 4 groups along with TXL administration (7.5 mg/kg, weekly), received various doses of RJ (0, 50, 100 and 150 mg/kg, b.w.). The last group received only RJ at 100 mg/kg. Twenty four hours after the last treatment, all groups after blood sampling were euthanized and the liver samples cleaned out and kept at -70 °C for further analyses. Biochemical hepatic functional assays including the determination of serum level of ALP and ALT and LDH were conducted by using the standard available kits. Additionally, the expression of two important transcription factors E2f1 and c-Myc at mRNA level in the liver of TXL-exposed non-treated and RJ-treated animals was evaluated. The hepatic functional biomarkers showed a significant ($P<0.05$) elevation in the TXL-received animals, while the administration of RJ for 28 days resulted in a remarkable and dose-dependent reduction of TXL-elevated ALP, ALT and LDH levels.

Results: The TXL-treated animals showed a significant ($p<0.05$) up-regulation of E2f1 and down-regulation of c-Myc at mRNA level, respectively. RJ administration lowered the expression of E2f1, while enhanced the expression of c-Myc in a dose-dependent manner. In conclusion, we showed that TXL at tested dose level (7.5 mg/kg, weekly) can result in hepatic injuries, which were characterized by marked alterations in hepatic functional enzymes concentration. All aforementioned factors were improved in those animals which co-treated with TXL and RJ.

Conclusion: We found a clear cross talk between E2f1 and c-Myc as two critical regulators of liver growth in TXL-induced hepatotoxicity.

Keyword: Hepatotoxicity; Hepatic Functional tests; Transcriptional factor

Abstract No: 423

The protective effect of *Achillea millefolium* on failure effects of nicotine on sperm parameters and fertility in male rats

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Abstract

Background: Adverse effects of the nicotine on the male reproductive system in the different species of mammals are well studied. According to a report nicotine affects sperm and disturbs its function. Nicotine as an alkaloid is a very important constituent of the cigarette smoke can exert excessive nauseous effects on sperm motility. The result of studies suggest a protective effect of *Achillea millefolium*, plant extract on sperm fertility. The aim of this present study was evaluate how *Achillea millefolium* alcoholic extract could serve as a protective agent against failure reproductive male effects during nicotine treatment.

Methods & Materials: For this study 25 adult rats were divided into five groups each with 5 rats. Two groups were received nicotine at rate of 0.2 and 0.4 mg/kg BW/day respectively by IP route. The other two groups were received nicotine at rate of 0.2 and 0.4 mg/kg-BW/day by IP route along with *Achillea millefolium* alcoholic extract at a rate of 120 mg/kgBW/day through oral route respectively for 48 days. A vehicle treated control group was also included. Animals were euthanized by CO₂ exposure in a special device 24 h after the last treatment. Statistical analysis of the results in nicotine groups show a significant reduction in sperm count and motility compared to the control group. Though groups receiving *Achillea millefolium* along with nicotine, significantly and substantially have shown an increase in number of sperm cells compared to groups that only had received nicotine. To evaluate the percentage of dead and morphologically immature sperms eosin -negrozin stained were used.

Results: Results showed that, treatments with two doses of nicotine significantly increase in the percentage of dead and immature sperm, while *Achillea millefolium* co-administration with low and high doses of nicotine improves sperm mortality and reduces in the percentage of immature sperms.

Conclusion: The results showed that nicotine can cause dose-related changes in sperm evaluation parameters including sperm count, infertility, motility, dead and immature sperms, while co-administration of alcoholic extracts of *Achillea* with nicotine, have been improved failure effects of nicotine.

Keywords: Achille amillefolium, testes, Nicotine, sperm parameters, rat.

Abstract No: 72

Compensatory Role of vitamin E on Testis Tissue and Sperm parameters in Mice Treated with Phenylhydrazine

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Abstract

Background: Hemolytic anemia and consequently the reduction of oxygen can because the deleterious effects on testis function and Spermatogenesis. Accordingly, the iron released from RBC and following that increasing the iron in tissue may exerts Stress Oxidative. Therefore, this survey was done with the aim of reducing harmful effects of hypoxia on reproductive organs. Present study was carried out to evaluate the protective role of vitamin E on testis and sperm parameters under Oxidative Stress conditions due to hemolytic Anemia.

Materials & Methods: 24 adult mice (weighing 25-20 gr at 6 to 8 weeks of age) were divided equally into 4 groups in that group 1, control group, that received normal saline (0.1ml, IP). The group 2 was received phenylhydrazine (PHZ) with dose of 8mg/100 gr b. w, IP, IP at first time and followed by 6mg/100 gr b. w/48h, IP. The group 3 received vitamin E (100 IU/kg, IP) along with PHZ and the group 4 received only vitamin E (100 IU/kg, IP). After scarifying the animals by vertebral dislocation, testicular samples were processed and paraffin sections stained with H & E staining method and they were evaluated respecting factors such as morphometric parameters such as the thickness of the tunica albuginea, leydig and Sertoli cells, germinal epithelium height, diameter of seminiferous tubules, TDI, SPI, RI, as well as sperm parameters such as motility, viability, chromatin condensation and DNA damage in sperm.

Results: It was revealed that Tubular Differentiation Index (TDI), Reproduction Index (RI), Spermiogenesis Index (SI), leydig and Sertoli cells, germinal epithelium height and diameter of seminiferous tubules were increased significantly in control and experimental groups compared to PHZ group ($p < 0.05$). Finally, administrating vitamin E resulted in remarkable ($P < 0.05$) enhancement in sperm parameters.

Conclusion: These results indicate that vitamin E protective role on oxidative stress originated from Anemia with Phenylhydrazine.

Keyword: testis tissue, sperm parameters, phenylhydrazine, vitamin E, mice

Abstract No: 353

The effect of aflatoxin B1 on levels of gonadotropic hormones (FSH, LH and Prolactin) and Gonadal hormones (Estradiol and Progesterone) in adult female rat

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Abstract

Background: Aflatoxins (AFs) are natural contaminants of feed and feedstuffs, therefore the study of the noxious effects of these agents on the female reproductive system bear outstanding importance. Our aim for this study was the evaluation of the effects of oral administration of aflatoxin B1 on the reproductive hormonal changes in adult female rat.

Materials & Method: Twenty eight female healthy adult Wistar rats were selected for this study. The animals were divided into 4 groups (n=7 per group): control (C), test groups (T1, T2, and T3). The test groups T1, T2, and T3 were received toxin at 0.8 ppm, 1.6 ppm, 3.2 ppm, rates respectively through oral route and the control group received distilled same volume of sterile water for a period of 25 days. At the end of this period, all rats were euthanized and their blood collected for hormonal assay. The hormonal assays were carried out using ELISA biochemical kits for serum FSH, LH, Prolactin, Estradiol, Progesterone.

Result: The results of this study proved that, the levels of hypophyseal hormones, including FSH, LH and Prolactin are significantly decreased ($p < 0.05$) based on increase in dose of AFB1, but the levels of Estradiol and Progesterone are pointedly decreased ($p < 0.05$) irrespective of increase in AFB1 doses.

Keyword: Rat, Aflatoxin B1, Pituitary hormones, gonadal hormones

Abstract No: 340

The Effect of hydro-alcoholic extract of *Achillea millefolium* on in Vitro Fertilization (IVF) in Cyclophosphamide Treated Mice

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Abstract

Background: Apart from being an immunosuppressant agent, Cyclophosphamide (CP) has been known to induce oxidative stress, impact on gonadal cells' DNA and reduce the fertilizing potential. Therefore, the present study was aimed to evaluate the effects of hydro-alcoholic extract of *Achillea millefolium* (AM) inflorescences, as a potential antioxidant on in vitro fertilization in CP Treated Mice.

Materials & Methods: In order to 30 Male adult NMRI mice, aged 6-8 weeks, were randomly divided into five groups and treated for 35 days. The control group received distilled water (0.1 ml/kg, daily), Group 2 received CP alone (5mg in 50ml distilled water /kg, daily), Group 3 received CP (5mg in 50ml distilled water /kg, daily) + hydro-alcoholic extract of AM (75mg/kg, daily). Group 4 received CP (5mg in 50ml distilled water /kg, daily) + hydro-alcoholic extract of AM (150mg/kg, daily) and Group 5 received CP (5mg in 50ml distilled water /kg, daily) + hydro-alcoholic extract of AM (300mg/kg, daily). The oocytes were obtained from 15 mature female mice. Animals were anesthetized to easy draw, after extraction and normal sperm and fertilized oocytes were incubated for 120 hours in presence of HTF + 4 mg BSA. Statistical analyses were performed using ANOVA and Tukey test.

Result: In group 2, the blastocyst formation and fertilization rate significantly decreased compared to control group ($p < 0.05$). In group 4, the above-mentioned parameters were restored to near normal level ($p < 0.05$) and in the group 5 all of these parameters significantly decreased compared to group 2 ($p < 0.05$). These findings manifested that AM (Medium dose) may be partially protective against Cyclophosphamide-induced embryo toxicity. But high dose of AM (300mg/kg) caused a significantly remarkable reduction in IVF.

Keyword: *Achillea millefolium*, IVF, Cyclophosphamide, embryo toxicity, Mice

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